Workshop manual

Rider 15V2
Rider Pro 15
Rider Pro 18

English

Workshop manual
Rider 15V2, Rider Pro 15 , Rider Pro 18
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Safety regulations

General instructions

The workshop handbook is written for personnel who are assumed to have general ride-on mower reparation and service know-how.

The workshop where the ride-on mower is repaired should be equipped with safety devices in accordance with local regulations.

No-one should attempt to repair the ride-on mower without having first read and understood the contents of this handbook.

The machine is tested and approved only with the equipment originally provided or recommended by the manufacturer.

The below-mentioned boxes are included in this workshop handbook, as is appropriate.

WARNING!
The warning box indicates a risk of injury to persons if the instructions are not followed.

IMPORTANT INFORMATION

This box indicates a risk of damage to the material if the instructions are not followed.

Special instructions

The fuel used in the ride-on mower has the following hazardous characteristics:

- Toxic fluid and fumes
- Can cause eye and skin complaints
- Can cause breathing difficulties
- Highly flammable

When using compressed air, do not direct the compressed air stream towards your, or anybody else's, body. Air can be forced into the blood stream, thereby constituting a danger to life.

Use eye protection when working with tensioned springs.

Use hearing protectors when test driving.

After test driving, do not touch the silencer before it has cooled down. Risk of burn injuries. This especially applies if the ride-on mower is equipped with a catalytic converter. If consumed, the lining on and in the catalytic converter element is dangerous to health. Use protective gloves when working with the catalytic converter/silencer.

The blades are sharp and can cause cutting injuries. Always use protective gloves when you are handling the blades.

Use protective glasses when working with the mowing deck. If the belt's tension spring comes off and flies upwards, this can cause injury to persons.

Use eye protection when working with the battery with the plugs removed.

Be extra careful when handling battery acid. Spilling acid on the skin can cause severe burn injuries. If acid is spilt on the skin, rinse immediately with water. If acid gets into the eyes, this can cause blindness. Contact a doctor.

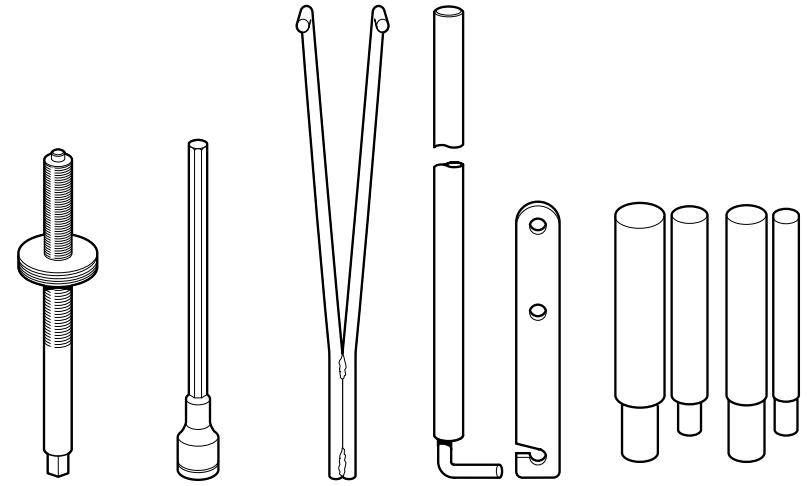
Be careful with the maintenance of the battery. Explosive gas is formed in the battery. Never handle the battery when smoking or in the vicinity of naked flames or sparks. Otherwise, the battery can explode and cause severe injuries.

IMPORTANT INFORMATION

Waste oil and old filters should be handled as hazardous waste.

Special tools

The following special tools are used when working on the ride-on mower.
Special tools for the engine and transmission are specified in the respective Workshop Manuals.



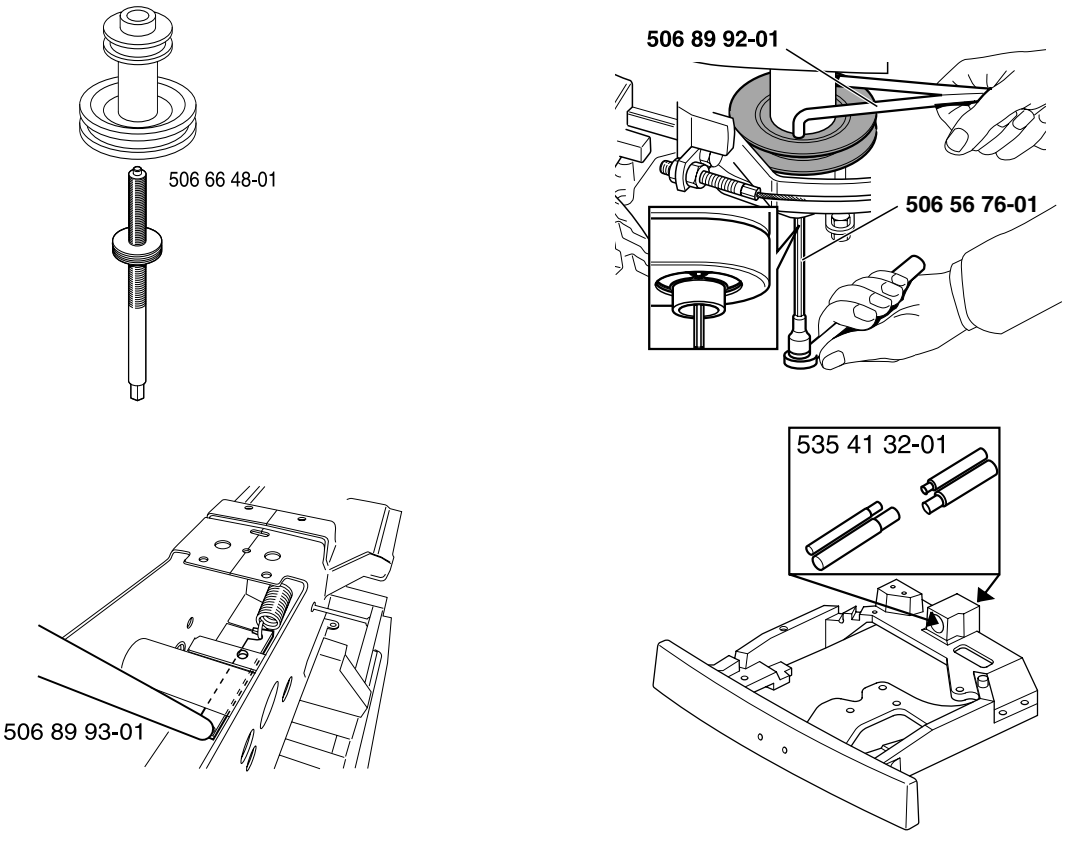
506 66 48-01 Puller for engine pulley.

506 56 76-01 Ball-ended Allen key 5/16" to unscrew the engine pulley socket head cap screw (Kawazaki).

506 89 92-01 Counter-hold for engine belt pulley.

506 89 93-01 Tool for the articulation spring.

535 41 32-01 Punch kit for pendulum shaft bushings.



Technical data

Dimensions:	**Rider Pro15V2**	**Rider Pro 15**	**Rider Pro 18**
Length, base machine	2 000 mm/6,56 ft	2 030 mm/6,66 ft	2 030 mm/6,66 ft
Width, base machine	900 mm/2,95 ft	900mm/2,95 ft	900 mm/2,95 ft
Height	1 080 mm/3,54 ft	1 080 mm/3,54 ft	1 130 mm/3,71 ft
Kerb weight, base machine	222 kg/488 lb	240 kg/528 lb	261 kg/574 lb
Wheel base	860 mm/2,82 ft	873 mm/2,86 ft	873 mm/2,86 ft
Track width, rear	625 mm/2,05 ft	625 mm/2,05 ft	625 mm/2,05 ft
Track width, front	625 mm/2,05 ft	720 mm/2,36 ft	625 mm/2,05 ft
Tyre size	16 x 6.50 x 8	16 x 6.50 x 8	16 x 6.50 x 8
Tyre pressure, front & rear	60 kPa/8,5 PSI	60 kPa/8,5 PSI	60 kPa/8,5 PSI
Max. gradient	15°	15°	15°
Engine:			
Manufacture	Kawasaki V-Twin	Kawasaki V-Twin	Kawasaki V-Twin
Modell	FH430V-BS50	FH430V-BS50	FH531V-BS50
Power	11,2/15 kW/hp	11/15 kW/hp	13,2/18 kW/hp
Displacement	431 cm^3 / 26,3 cu.in	431 cm^3 / 26,3 cu.in	494 cm^3 / 30,1 cu.in
Fuel	min 87 octane unleaded	min 87 octane unleaded	min 87 octane unleaded
Tank volume	7 litres/7,4 US qt	7 litres/7,4 US qt	17 litres/18 US qt
Oil	SAE 30 or SAE 10W/30, 10W/40 class SF-SJ	SAE 30 or SAE 10W/30, 10W/40 class SF-SJ	SAE 30 or SAE 10W/30, 10W/40 class SF-SJ
Oil volume excl. filter	1,5 litres / 1.6 US qt	1,5 litres / 1.6 US qt	1,5 litres / 1.6 US qt
Oil volume incl. filter	1,7 litres / 1.8 US qt	1,7 litres / 1.8 US qt	1,7 litres / 1.8 US qt
Start	Electric start	Electric start	Electric start
Gearbox:			
Manufacture	Tuff Torq K 46	Tuff Torq K 62F	Tuff Torq K 66M
Oil	SAE 10W/30 class SF-CC	SAE 10W/30, class SF-CC	SAE 10W/30, class SF-CC
Oil capacity	2,2 litres/2,35 US qt	2,5 litres/2,64 US qt	2,5 litres/2,64 US qt
Electrical system			
Type	12 V, negative earth	12 V, negative earth	12 V, negative earth
Battery	12 V, 24 Ah	12 V, 24 Ah	12 V, 24 Ah
Main fuse	Flat pin yoke 15 A	Flat pin yoke 15 A	Flat pin yoke 15 A
Spark plug	Champion RCJ8Y,	Champion RCJ8Y,	Champion RCJ8Y,
Electrode gap	0,75 mm / 0.030"	0,75 mm / 0.030"	0,75 mm / 0.030"
Lights	---	---	2x12V 20 W

Tightening moments

Carrier steering	5-10 Nm	3,5-7 lbft
Pulley steering wire	20-30 Nm	14-21 lbft
Belt wheel	35-40 Nm	25-28 lbft
Blades M10 bolt	45-50 Nm	32-36 lbft
Blades M12 bolt	75-80 Nm	53-56 lbft
Blade bearings	20-25 Nm	14-18 lbft
Belt tensioner wheel	15-25 Nm	10-18 lbft
Holder screws, engine	20-25 Nm	14-18 lbft
Holder screws, gear box	20-25 Nm	14-18 lbft
Engine pulley	70-80 Nm	50-56 lbft

Mowing deck	**BioClip 90**	**Combi 103**	**Combi 112**
Cutting width	900 mm/35"	1 030 mm/41"	1 200 mm/44"
Cutting heights	45-95 mm/1 9/16"-3 9/16"	45-95 mm/1 9/16"-3 9/16"	45-95 mm/1 9/16"-3 9/16"
Blade length	440 mm/17,3"	410 mm/16,1"	420 mm/16,5"
Sound level	100 dB(A)	100 dB(A)	100 dB(A)
Width	1 000 mm/3,28 ft	1 115 mm/3,66 ft	1 230 mm/4,03 ft
Weight	39 kg/85,8 lb	48 kg/105,5 lb	50 kg/110 lb

Mowing deck	**Combi 122**	**Side ejector 97**	**Rear ejector 97**
Cutting width	1 220 mm/48"	970 mm/38"	970 mm/38"
Cutting heights	45-95 mm/1 9/16"-3 9/16"	40-90 mm/1 3/4"-3 3/4"	40-90 mm/1 3/4"-3 3/4"
Blade length	450 mm/17,7"	350 mm/13,8"	350 mm/13,8"
Sound level	100 dB(A)	100 dB(A)	100 dB(A)
Width	1 330 mm/4,36 ft	1 300 mm/4,27 ft	1 075 mm/3,53 ft
Weight	60 kg/132 lb	45 kg/99 lb	48 kg/105,5 lb

Control points

Mowing deck parallelism with cutting height in pos. 1:	± 2 mm	± 0,079"
Inspection of cutting height (cover-ground) in position 1:	Bio 90, 103 = 40 mm	1 7/16"
	Other = 35 mm	1, 3/8"
Dist. between support plate and drive belt:	3–6 mm	1/8" - 1/4"
Distance belt tensioner control lever and belt guide, disengaged unit:	17 ± 5 mm	7/16" ± 3/16"

Play

Brake wire:	1 mm	0,040"
Wire for hydrostatic transmission pedals:	0 mm	0"

Delivery and dealer service

Pre-delivery service

1. Top up battery with acid and recharge for four hours.
2. Fit steering wheel, seat and any optional equipment.
3. Fit cutting unit.
4. Adjust cutting unit:

   Adjust lift springs (effective weight of cutting unit should be 12–15 kg (26,5-33 lb), or set to maximum lift if brush is to be fitted). Applies to BioClip and Combi.

   Adjust cutting unit so that rear edge is about 2–4 mm (1/8") higher than front edge.

   Adjust cutting unit height setting so that cutting height limit is 5 mm (3/16")above the frame of the unit at the lowest cutting height.
5. Check that the right amount of oil is in the transmission.
6. Check and adjust tyre pressure (60 kPa, 0,6 bar, 8,5 PSI).
7. Connect battery.
8. Fill with fuel and start engine.
9. Check that machine does not move in neutral.
10. Check:

    Forward drive.

    Reverse drive.

    Operation of blades.

    Seat safety switch.

    Lift lever safety switch.

    Safety switch for hydrostatic transmission pedals.
11. Check engine speed Rider 15 2,900 ±100 rpm, Rider 18 3,000 ±75 rpm.
12. Tell customer about:

    Need and benefits of following the service schedule.

    Need and benefits of having machine serviced every 300 hours.

    Service and the effect of the service journal on the machine’s second-hand value.

    Application areas for BioClip and Combi.
13. Complete proof of sale, etc.

After first 8 hours

1. Change engine oil.

25 hour service

1. Check the fuel pump's air filter.
2. Check/clean the engine cooling air intake.
3. Clean the cooling air intake to the transmission.
4. Clean the air filter's pre-filter (plastic foam).

50 hour service

1. Carry out 25 hour service.
2. Clean/replace the air filter cartridge (paper filter).
   (More frequent intervals in dusty conditions.)
3. Check/adjust the mowing height setting.
4. Check/adjust the parking brake.
5. Inspect the flame guard/spark arrester. (optional equipment)

100 hour service

1. Carry out 25 hour service.
2. Carry out 50 hour service.
3. Change the engine oil.
4. Check whether the engine's oil filter needs changing (every 200 hours).
5. Clean/replace the spark plug.
6. Replace the fuel filter in the fuel line.
7. Clean / replace the pulse air filter on Pro 15 and Pro 18.
8. Clean the cooling fins on the engine and transmission.
9. Check whether the oil and filter need changing in the transmission (every 500 hours).
10. Check whether the air filter's paper insert needs cleaning or changing (every 200 hours).

300 hour service

1. Inspect the machine. Agree with the customer as to what additional work is to be carried out.
2. Carry out 25 hour service.
3. Carry out 50 hour service.
4. Carry out 100 hour service.
5. Clean the combustion chamber and grind the valve seats.
6. Check the engine's valve clearance.
7. Replace the air filter's pre-filter (plastic foam).

At least once a season

1. Clean the engine's cooling air intake (25 hours).
2. Replace the air filter's pre-filter (plastic foam) (300 hours).
3. Replace the air filter's paper insert (200 hours).
4. Change the engine oil (100 hours).
5. Change the engine's oil filter (200 hours).
6. Adjust the mowing height setting (50 hours).
7. Adjust the parking brake (50 hours).
8. Inspect the flame guard/spark arrester, optional equipment (50 hours).
9. Clean/replace the spark plug (100 hours).
10. Replace the fuel filter in the fuel line (100 hours).
11. Clean / replace the pulse air filter on Pro 15 and Pro 18 (100 hours).
12. Clean the cooling fins (100 hours).
13. Check the engine's valve clearance (300 hours).
14. Change the oil in the transmission (500 hours).
15. Change the filter in the transmission, Pro 18 (500 hours).
16. 300 hours service is carried out by an authorised service workshop.

Maintenance schedule

The following is a list of the maintenance which should be conducted on the machine. Most of the points that are not covered by this workshop manual are covered by the operator's manual.

● = Covered by this workshop manual.
❍ = Not covered by this workshop manual or operating Instructions.
▼ = Described in the operating Instructions.

Maintenance	Page	Daily maintenance		Weekly[3] maintenance	At least once a year	Maintenance interval in hours			
		before	after			25	50	100	300
Check for fuel and oil leakage	-	❍							
Check the parking brake	33	●							
Check the engine oil level	12	●							
Check the fuel pump air filter	-	▼							
Check the seat safety switch	67	●							
Check the lift lever safety switch	67	●							
Check the safety switch, pedal system	67	●							
Check/clean the engine cooling air intake	-		▼						
Check the cutting unit:	-		●						
• blades are secure	60		●						
• condition of blades (sharpness, shape, etc.)	62		●						
• blade synchronisation (90° between BioClip)	57		●						
Check steering wires (for play, etc.)	29		●						
Check fasteners (screws, nuts, etc.)	-		❍						
Start engine and blades, listen for noise	-		❍						
Clean underside of cutting unit	-		▼						
Clean transmission air intake	-		▼						
Check battery acid level	11			●					
Check transmission oil level	13			●					
Check condition of V-belts, pulleys, etc.	-			❍					
Check for damage	-			❍					
Check tyre pressures (60 kPa/9,5 PSI)	13			●					
Check for damage to wire guide at articulated joint	-			❍					
Clean thoroughly around engine	-			▼					
Clean thoroughly around transmission	-			▼					
Clean all belts, pulleys, etc.	-			▼					
Lubricate belt tensioner (nipple)	-			▼					
Lubricate triangle link (nipple)	-			▼					
Lubricate joints and seat skid rails.	-			▼					
Lubricate all wires	-			▼					
Lubricate joints on cutting unit	-			▼					
Clean inside frame tunnel	-			❍					
Lubricate pedal mechanism inside frame tunnel	-			▼					
Lubricate the gear control	-			▼					
Lubricate the parking brake wire	-			▼					
Lubricate throttle control	-			▼					

Maintenance	Page	Daily maintenance before	Daily maintenance after	Weekly[3] maintenance	At least once a year	Maintenance interval in hours 25	50	100	300
Lubricate choke control	-			▼					
Lubricate steering chain inside frame tunnel	-			▼					
Check steering wires inside frame tunnel	29			●					
Clean engine cooling air intake	-				▼	▼			
Clean the air filter's pre-filter (plastic foam)	-				▼	▼			
Change engine oil[1]	29				●			●	
Clean the air filter's cartridge [2] (paper filter)	-				▼		▼		
Check/adjust cutting height setting	51				●		●		
Check/adjust parking brake	33				●		●		
Inspect flame guard/spark arrestor (optional equipment)	-				❍		❍		
Change the engine's oil filter (every 200 hours).	-				▼			▼	
Replace the hydraulic oil filter (every 200 hours)[4-5]	71				●			●	
Clean/replace spark plugs	-				▼			▼	
Replace fuel filter in pipe	-				▼			▼	
Clean / replace pulse air filter (Pro 15, Pro 18)	62				●			●	
Clean the cooling fins	-				❍			❍	
Check engine valve clearance[4]	-				❍				❍
Check whether oil change[4] or filter change[4-5] are necessary for gearbox (every 500 hrs)	50				●			●	
Replace the air filter's pre-filter (plastic foam)[2]	-				▼				▼
Replace the air filter (paper filter)[2] (every 200 hours)	-				▼			▼	
Carry out 300 hour service [4]	7				●				●

[1] First change after 8 hours. When driving with a heavy load or when the ambient temperature is high, replace every 50 hours. [2]Clean and replace the filter more often in dusty conditions. [3] For daily use of the machine lubrication should be conducted twice a week.
[4] Conducted by authorised service workshop. [5] Pro 18 only.

● = Covered by this workshop manual.
❍ = Not covered by this workshop manual or operating Instructions.
▼ = Described in the operating Instructions.

WARNING!
No service procedures must be conducted on the engine or cutting unit unless:

- **The engine is switched off.**
- **The ignition key is removed.**
- **The ignition cables are removed from the plugs.**
- **The parking brake is applied.**
- **The cutting unit is disengaged.**

Delivery measures

To our dealer

Well-performed delivery service is the first step to a functioning aftermarket. A functioning aftermarket is in everybody's interest:

- The customer is satisfied with their Rider. He/she knows where to go to get help if problems occur.
- You have a regular customer, who recommends you and your company to other potential customers.
- In this way we build our trademark together, and take joint responsibility for our products and customers.

Make sure the paper work is in good order.

Fill in the warranty and delivery documents etc. and make sure that the customer gets the right Operating Instructions for their machine.

Keep a customer register so that in future you can see which machines customers have, including all the serial numbers. This register will benefit you when ordering spare parts and for future marketing.

In conjunction with the delivery you should also give the customer the information required to ensure the safe handling and care of their machine. Pay special attention to informing the customer about:

- Safety instructions.
- Controls. Emphasise that one does not push in the reversing lock on Rider 11 when engaging the neutral position (start lock function).
- Checking of oil levels. Replenishing of oil, and which type of oil is required.
- First oil change after the running-in period.
- The need for, and advantages of, following the service schedule and regularly handing in their Rider for service.
- Which fuel should be used.
- Mowing tips to get good results. Applications for BioClip.
- Which accessories are available for the type of Rider in question.
- Warranty regulations.
- Your company, and who the customer can turn to if problems occur.

Packaging and unpacking

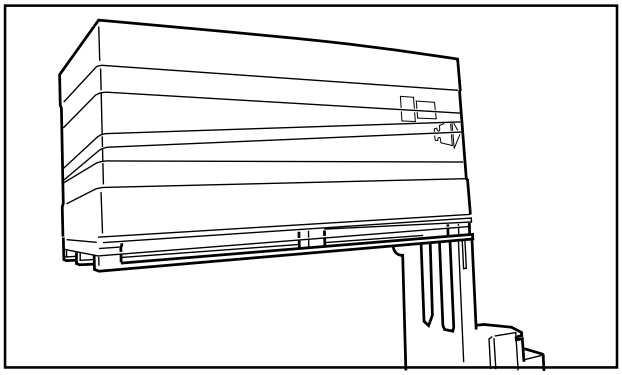
On delivery from the factory the Rider is normally packed in special packaging. This consists of a wooden bottom board with a top part consisting of heavy-duty cardboard held together by plastic film.

WARNING!
Handle the transport box carefully. Keep the goods as level as possible. Use long forks when lifting from the short side.

The bottom board is provided with pallet feet and the goods can be handled with a normal fork-lift truck from the long side. To keep the goods as level as possible, two men should help the truck driver. Lift the machine and drive the truck carefully.

Undo the plastic film and lift off the cardboard sections. The Rider is placed on the bottom board, braked and secured with wooden blocks.
Check that there is no transport damage after removing the packaging. Report any damage to the transport company in accordance with the standard routines.

The packaging should not be returned.



Lifting from the short side requires long pallet forks, see diagram.

Parts enclosed in packaging

The following parts are enclosed in the transport box:

Number	Part
1	Steering wheel with steering column tube
1	Socket head cap screw steering column tube
1	Lock nut steering column tube
2	Support rollers (BioClip)
6	Battery plugs
1	Operating Instructions
1	Owner's Manual, Kawasaki
4	Wheels (certain markets)

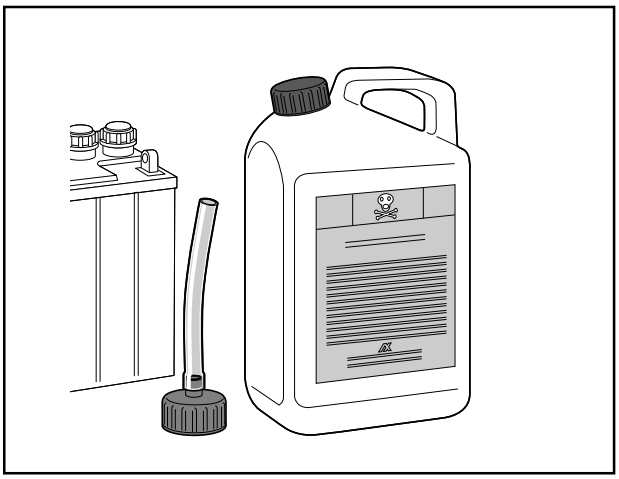
Battery

WARNING!

The battery acid is highly corrosive. Use rubber gloves and protective glasses. Avoid breathing in the acid fumes.

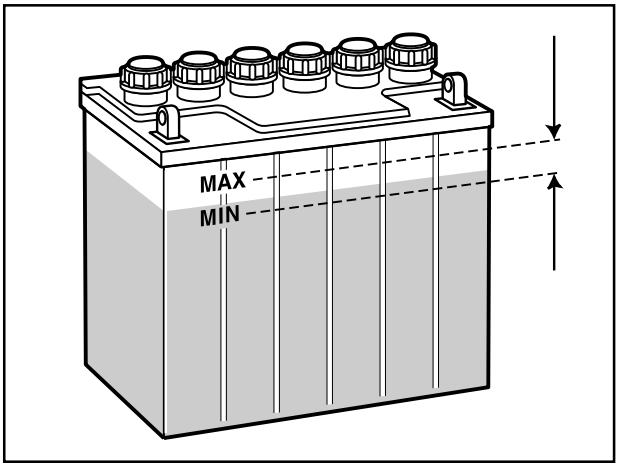
	Measures for contact with acid
External:	Rinse thoroughly with water.
Internal:	Drink large quantities of water or milk. Contact a doctor as soon as possible.
Eyes:	Rinse thoroughly with water. Contact a doctor as soon asap.

The battery gives off explosive gas. Sparks, naked flames and cigarettes must absolutely not be in the near vicinity of the battery.



The battery is delivered dry-charged from the factory. The cells are fitted with sealing film. The battery plugs are packed in a plastic bag.

- Fill the battery cells slowly with battery acid to the max. level mark on the battery container.
- Wait 20 minutes and top up with battery acid if necessary.
- Charge the battery with 12 V max. 6 A for 4 hours.
- Check the electrolyte level and top up if necessary with distilled water to the top level marks on the battery container.



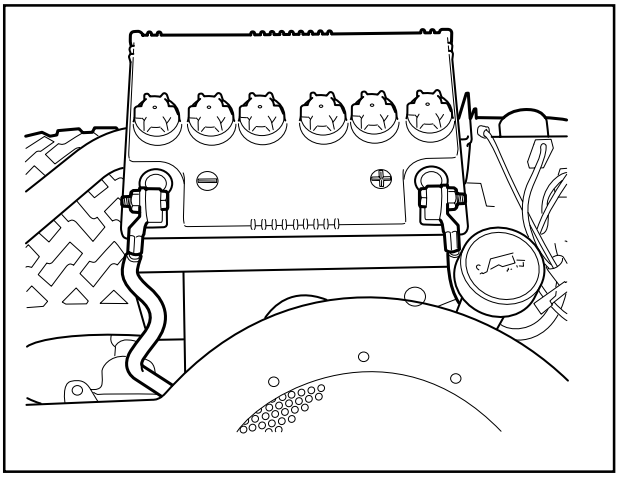
Put the battery in position.

Connect the battery with the screws and nuts fitted on the battery. Brace the screws when fitting to avoid exposing the terminals to strain.

- Black cable is connected to -.
- Red cable is connected to +.

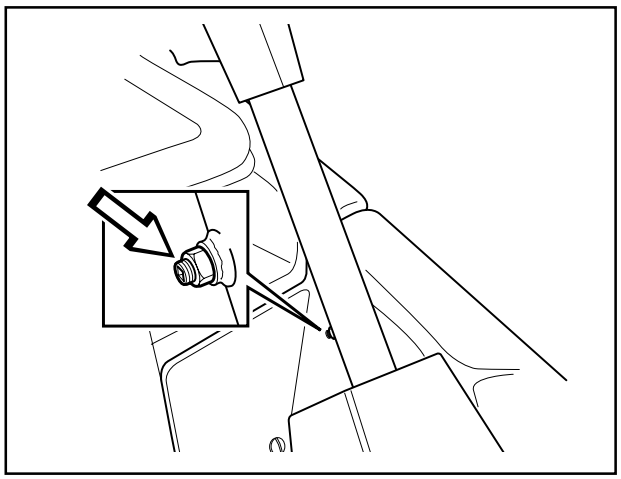
Make sure the cables do not rub against the material.

Fit the cover over the battery and tighten the strap.



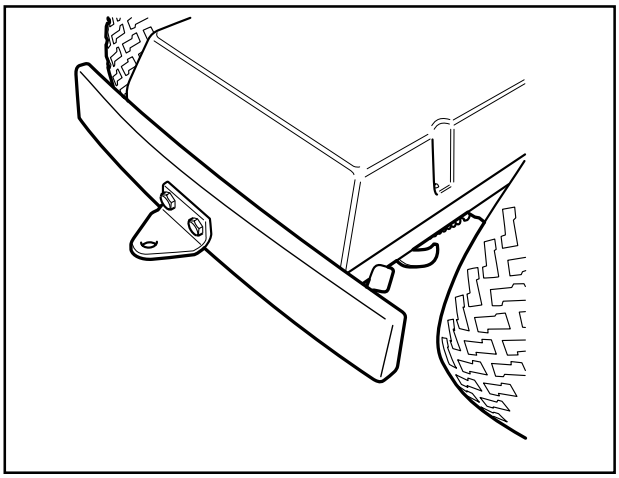
Steering wheel

- Fit the steering wheel with the steering column tube on the steering shaft.
- Screw in the socket head cap screw so that it goes in the slot on the steering shaft. Work on the steering wheel and tighten the socket head cap screw so that it bottoms in the slot.
- Fit the lock nut on the socket head cap screw.



Tow plate

The tow plate is fitted the “wrong way round” at the factory for transport reasons. Fit the tow plate on the rear bumper as shown in the diagram.



Check the oil level in the engine

Check the oil level in the engine when the Rider is standing horizontally with the engine switched off.

Lift up the engine cover.

Loosen the dipstick and pull it out. Wipe the dipstick and replace it.

The dipstick should **not** be screwed down.

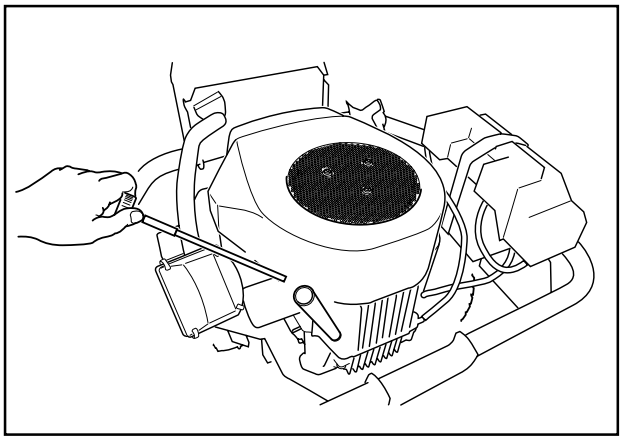
Loosen the dipstick and pull it out again. Check the oil level.

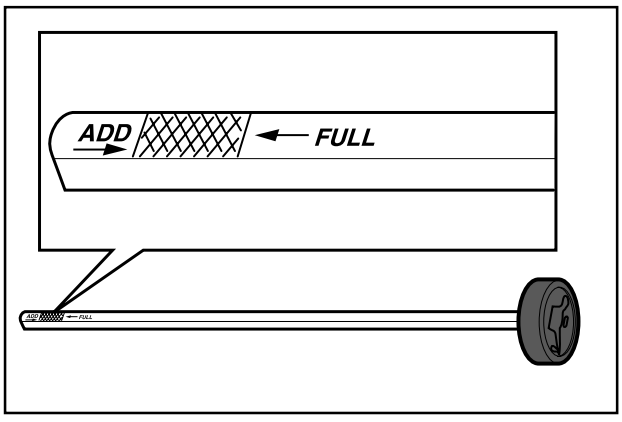
The oil level should lie between the markings on the dipstick. If the level is close to the “ADD” mark, top up with oil to the “FULL” mark on the dipstick.

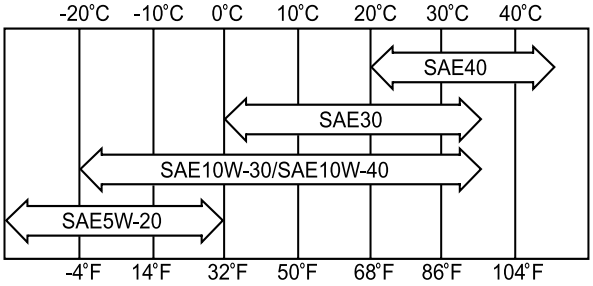
The oil is poured in the same hole the dipstick fits in.

Use engine oil with the viscosity shown in the diagram below, grade SF-SJ.

The engine takes a total of 1.5 litres of oil.

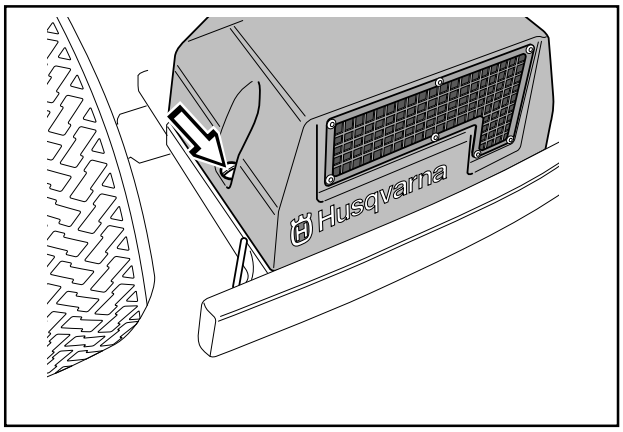




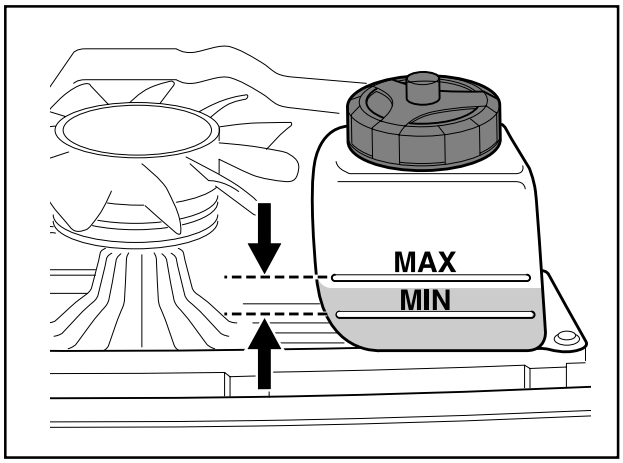


Checking the oil level in the transmission

Remove the transmission cover. Loosen both screws (one on each side) and lift off the transmission cover.



Check that there is oil in the transmission's oil tank. Fill if necessary with engine oil SAE 10W/30 (class SF–CC).



IMPORTANT INFORMATION

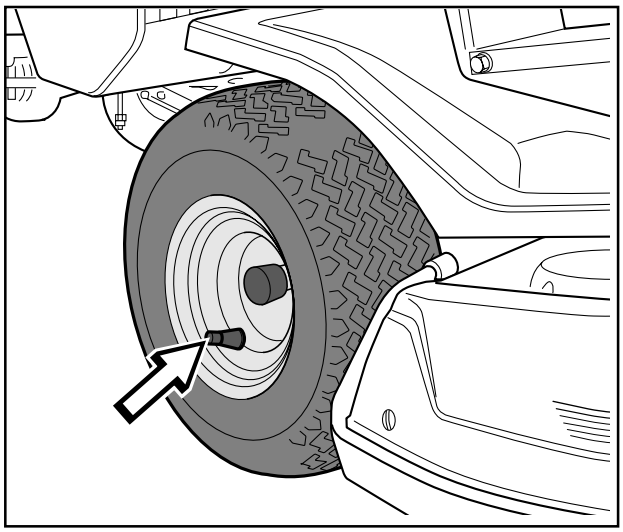
Check and top up with oil after each test drive. The oil level will drop if there are air pockets in the transmission.

Wheels

Fit the wheels (certain markets). The tyre pressures should be 60 kPa (0.6 kp/cm$^{2)}$/8,5 PSI) on all the wheels.

To improve the driving capacity the pressure in the back tyres can be reduced to 40 kPa (0.4 kp/cm$^{2)}$/ 5,6 PSI).

Maximum permitted pressure is 100 kPa (1.0 kp/cm$^{2)}$/14 PSI).



IMPORTANT INFORMATION

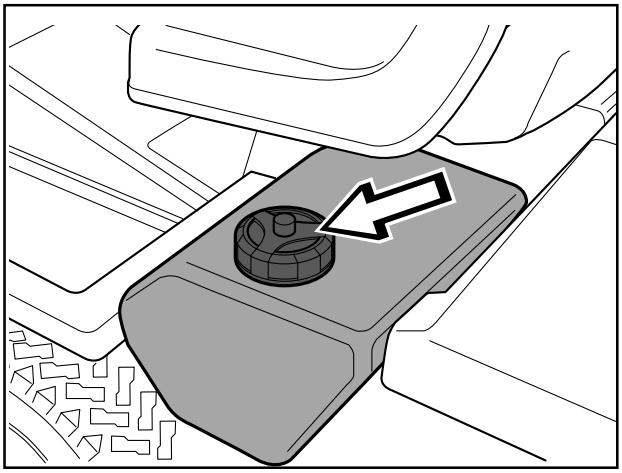
Different pressures in the front tyres will cause the blades to cut the grass at different heights.

Checking and adjusting of the mowing deck's ground pressure and parallelism

Carried out after checking the tyre pressures. See respective sections in this Workshop Manual.

Test running

Fill up with petrol. The engine should be run on the lowest 87 octane unleaded petrol (no oil admixture). It can be beneficial to use environmentally adapted alkylate petrol.



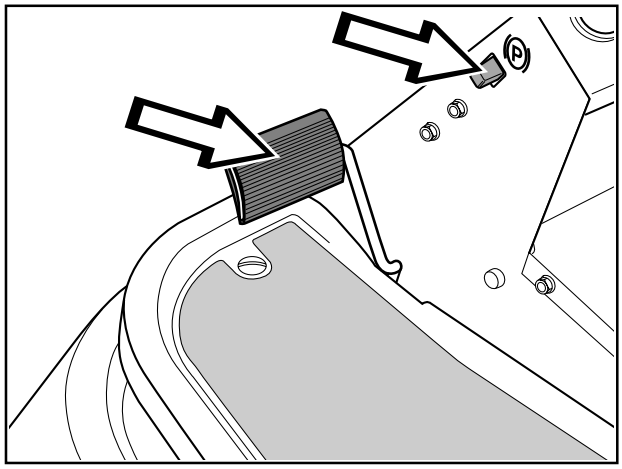
WARNING!
Petrol is highly inflammable. Observe caution and fill up with petrol outdoors.

WARNING!
Never run the engine indoors, or in enclosed or poorly ventilated areas. Engine exhaust fumes contain poisonous carbon monoxide.

Start the engine.

Check that the machine is in neutral and standing on level ground when the parking brake is released.

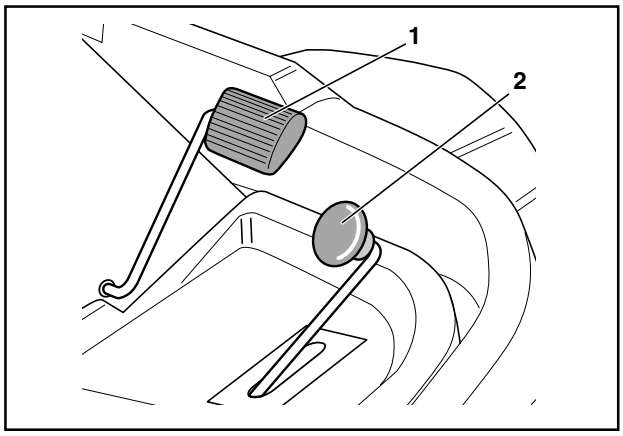
Check the function of the parking brake.



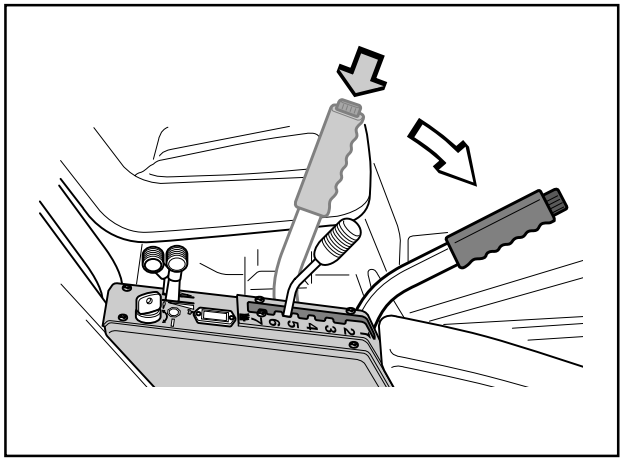
Check driving forwards (1) and backwards (2).

Check that the starter motor does not function when any of the hydrostatic transmission pedals are activated.

Check that the engine stops when getting up from the seat when any of the hydrostatic transmission pedals are activated.



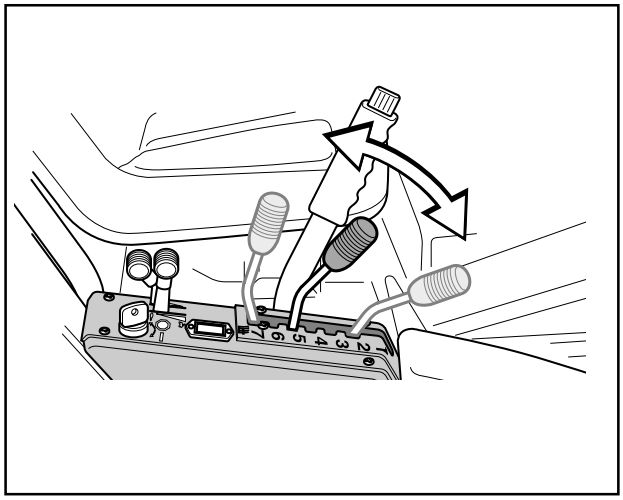
Check that the starter does not function when the mowing unit is in its lower position.



Check the function of the mowing deck and that there is no abnormal noise.

The mowing height can be set in 7 different positions with the lever. (Rider 15, 9 different positions).

See “Specifications” for the mowing heights on the different mowing decks.



Speed regulator

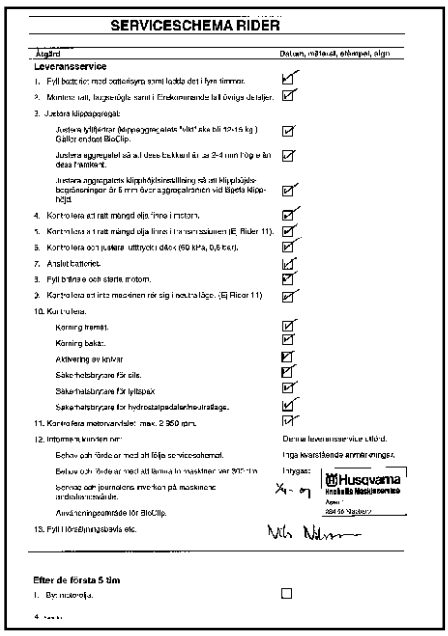
Check that the engine’s maximum speed is regulated at:

Rider 15V2	2 800-3000 rpm
Rider Pro 15	2 800-3000 rpm
Rider Pro 18	2 925-3025 rpm

Administration

Fill in the sales certificate and customer register etc.

Don’t forget to fill in the serial number on page 3 of the operator’s manual and to confirm that the delivery service has been performed in the service journal.



SERVICESCHEMA RIDER

Åtgärd	Datum, månadsl, ohvarpel, sign
Leveransservice	
1. Fyll bensin med bensinsyra samt ladda det i fyra timmar.	☑
2. Montera vall, bagskydd samt i förekommande fall övriga detaljer.	☑
3. Justera klippaggregat:	
Justera hjälphjul (klippaggregatets "vikt" ska bli 12-15 kg.) Gäller endast BioClip.	☑
Justera aggregatet så att dess bakkant är ca 2-4 mm högre än dess framkant.	☑
Justera aggregatets klipphöjdsinställning så att klipphöjdsbegränsningen är 5 mm över aggregatsnivån vid lägsta klipphöjd.	☑
4. Kontrollera att rätt mängd olja finns i motorn.	☑
5. Kontrollera att rätt mängd olja finns i transmissionen (E, Rider 11).	☑
6. Kontrollera och justera lufttrycket (60 kPa, 0,6 kp/cm²).	☑
7. Anslut batteriet.	☑
8. Fyll bränsle och starta motorn.	☑
9. Kontrollera att inte maskinen rör sig i neutralläge. (Ej Rider 11)	☑
10. Kontrollera.	
Körning framåt.	☑
Körning bakåt.	☑
Aktivering av knivar	☑
Säkerhetsbrytare för säte.	☑
Säkerhetsbrytare för lyftspak	☑
Säkerhetsbrytare för hydrostatpedalarmslutrastläge.	☑
11. Kontrollera motorvarvtalet: max. 3 350 rpm.	☑
12. Informera kunden om:	Denna leveransservice utförd.
Behov och tider av med att följa serviceschemat.	Inga kvarstående anmärkningar.
Behov och tider av vad att beakta in maskiner ver 30 km/h	Intygas: Husqvarna
Service och journalens innehåll på maskinens användarområde.	Ägare: 284 90 Nässjö
Användningsområde för BioClip.	
13. Fyll i försäljningsbevis etc.	

Efter de första 5 tim

1. Byt motorolja. ☐

Design and function

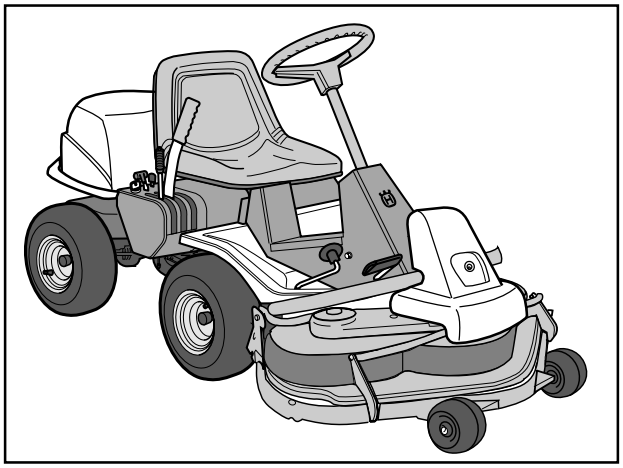
General

Husqvarna Riders is a series of ride-on mowers with a large capacity. This is available in several sizes, ranging from the smallest, the Rider 11, to the largest, the Rider ProFlex 21.

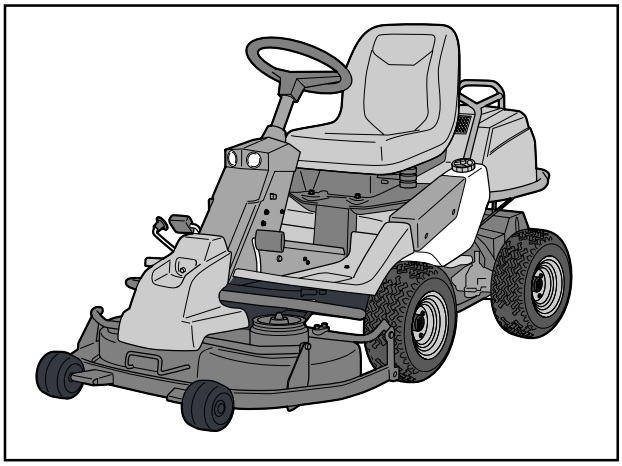
This workshop manual only deals with the mid-range models in the Rider series fitted with Kawasaki engines. There are special workshop manuals for the small machines with Briggs & Stratton engines and for the large ProFlex machines.

Pro and ProFlex models are only supplied with hydrostatic transmission.

Husqvarna Riders can, moreover, be equipped with various accessories such as moss rake and dozer blade which make them flexible working tools throughout the year.



Rider 15V2 is the largest consumer machine in the Rider series.



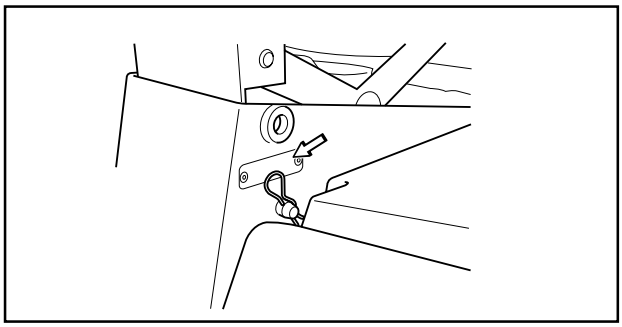
Rider Pro 15 and Pro 18 are the smallest machines in the Rider series, which have been specially designed for professional use. The illustration shows Pro 18.

Serial number

The serial number can be found on the printed plate attached to the front, left-hand side under the seat. Stated on the plate, from the top are:

- The machines type designation.
- The manufacturer's type number.
- The machine's serial number.

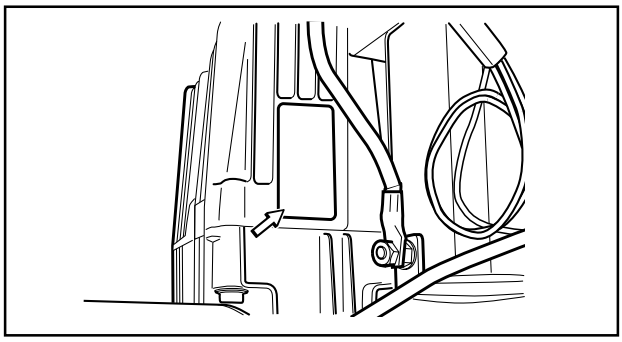
State the type designation and serial number when ordering spare parts.



The engine number is punched on a plate that is riveted to the fan cover. The plate states:

- Model.
- Type.
- Code.

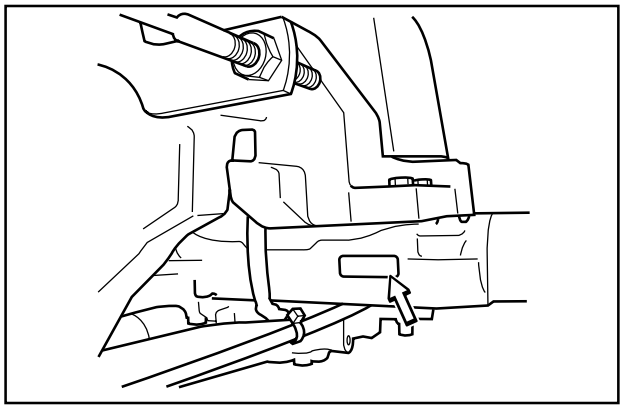
Please state these when ordering spare parts.



The transmission's serial number is stated on the barcode decal located on the front of the housing on the left-hand drive axle:

- The type designation is stated above the barcode and starts with the letter "K".
- The serial number is stated above the barcode and has the prefix "s/n".
- The manufacturer's type number is stated under the barcode and has the prefix "p/n".

State the type designation and serial number when ordering spare parts.



Engine

New Husqvarna Rider professional machines have two-cylinder, air-cooled engines from Kawasaki.

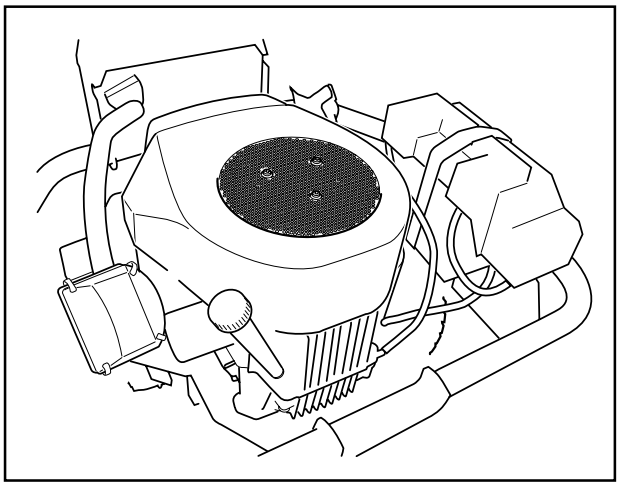
Major engine repairs are not described in this workshop manual. This information can be read in Kawasaki's own manuals, which contain detailed information on the adjustment and repair of the engines. The manuals can be ordered at an authorised service workshop.

The table below shows the model number for respective Rider models. These should be given when ordering manuals:

Model	Kawasaki's engine type
Rider 15V2	FH430V-BS50
Rider Pro 15	FH430V-BS50
Rider Pro 18	FH531V-BS50

It is important to only use genuine spare parts when repairing the engines. The warranty will no longer be valid if other parts are used.

Rider 15V2, Pro 15 and Pro 18 have two-cylinder, overhead valve engines with pressure lubrication and separate oil filters. Engines that are equipped with catalytic converters reduce hydrocarbon and nitrogen oxide emissions by up to 65% and carbon monoxide emissions by up to 45%.



Steering

All ride-on lawn mowers in the Rider series have articulated steering. The steering force from the steering wheel is transferred to the rear section via wires and a chain. This ensures that the ride-on mower is easy to manoeuvre, as well as having high-precision steering. A Rider easily cuts around all obstacles that may be found on the lawn.

Thanks to the articulated steering there is a very small turning radius and the uncut circle with a fully turned wheel is only 20-30 cm, depending on the model.

Rider Pro 18 is fitted with servo steering. Other machines only have the mechanical steering system, as illustrated below.

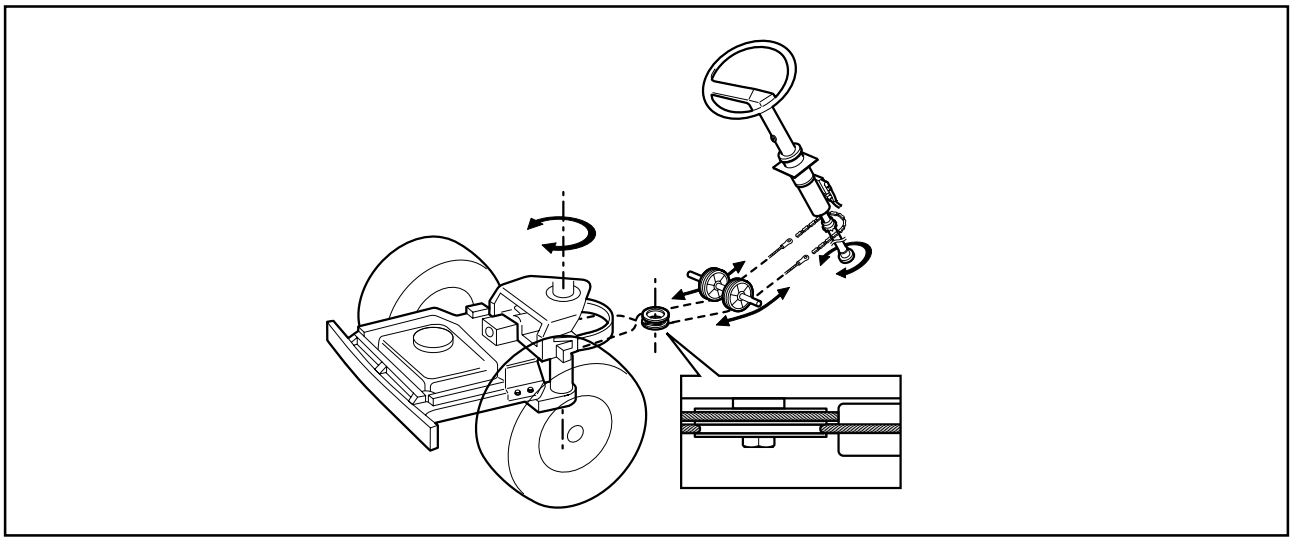


Illustration of the mechanical function of the articulated steering.

The illustration shows Pro 18, other machines do not have the power steering in the steering column.

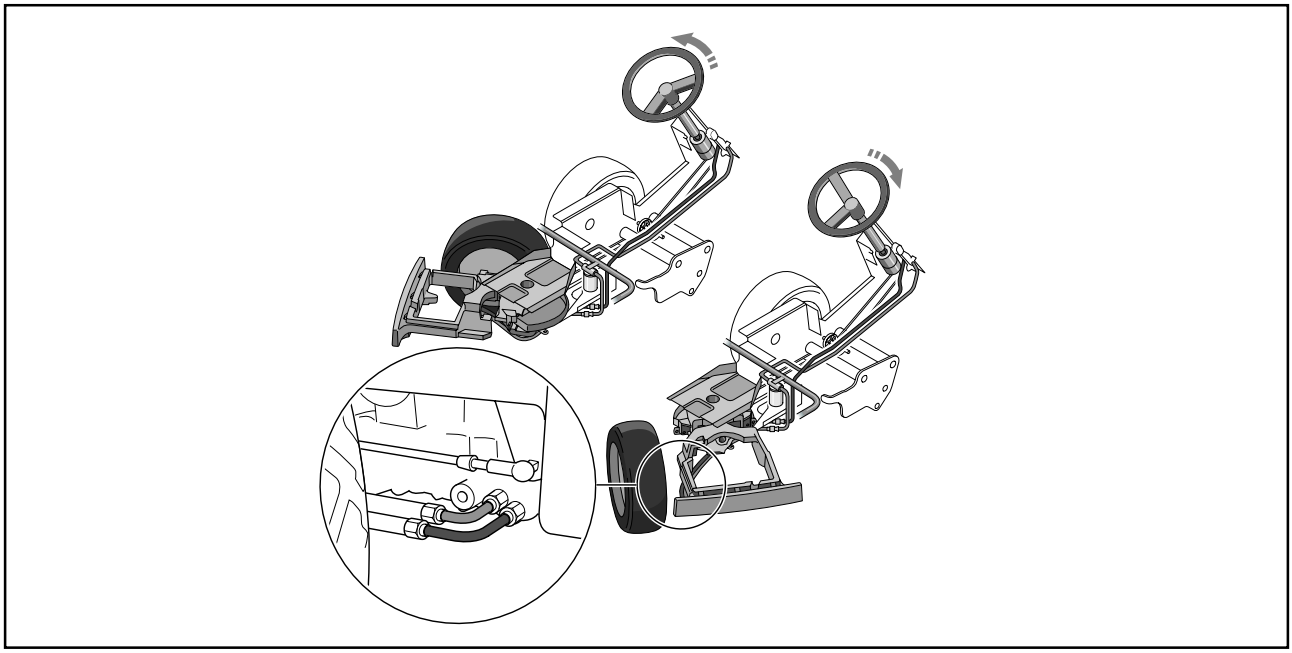


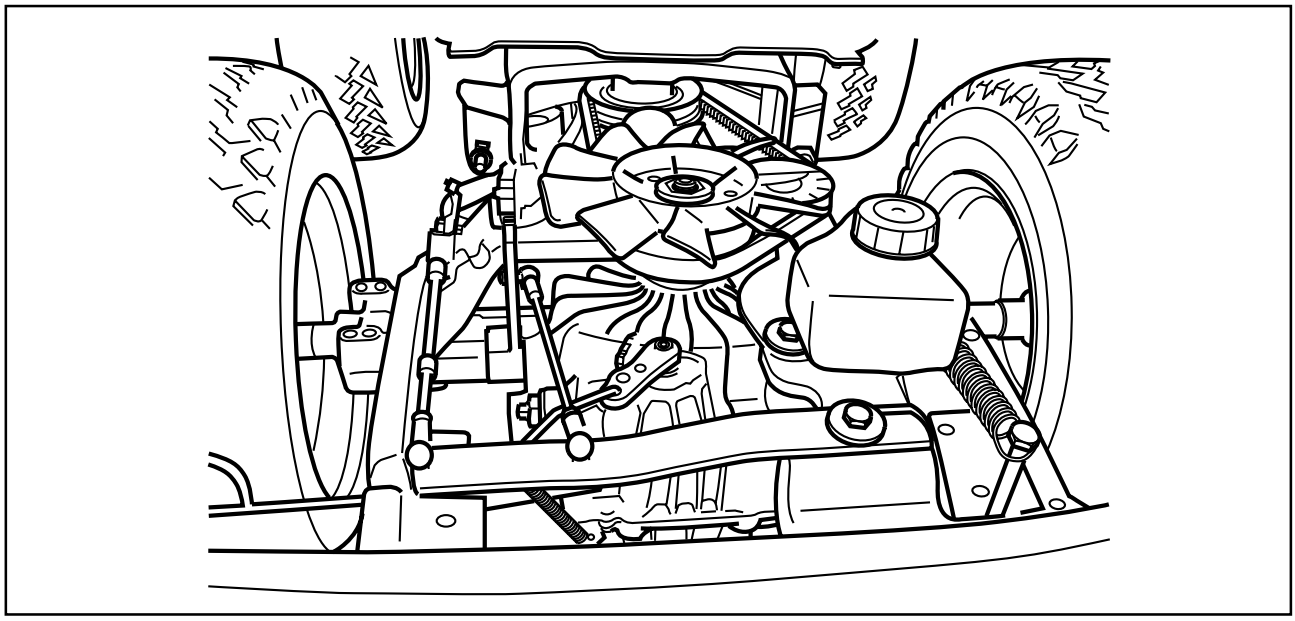
Illustration of the hydraulic function of the articulated steering on Pro 18.

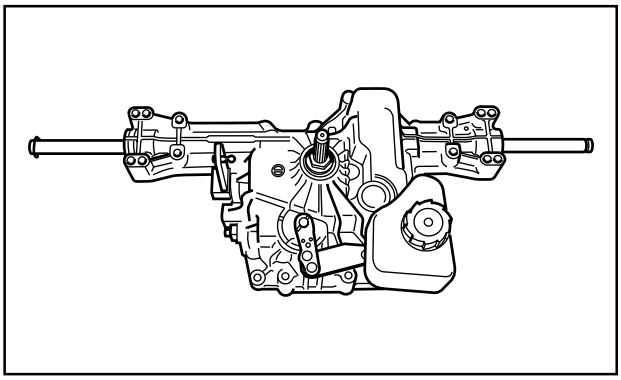
The servo steering obtains its pressure from the pump in the hydrostatic transmission. The power steering is mounted in the steering column and its stator section is fitted in the power steering housing, which is the front section of the machine's frame.

The power steering is, in principle, a hydraulic torque motor controlled by the steering wheel. When there is no hydraulic pressure, the machine can still be steered, as the steering shaft is mechanically attached to the sprocket wheel on the power steering's outgoing shaft (the rotor section).

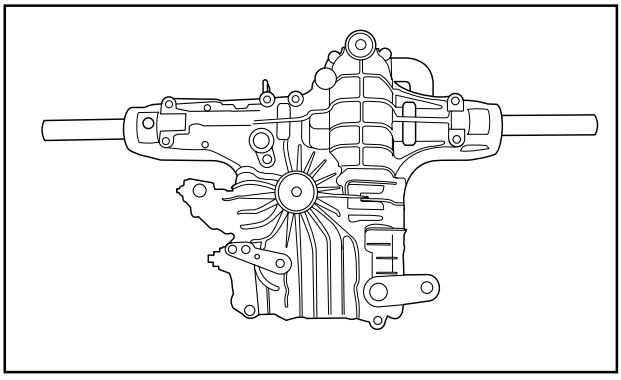
Driving

The machines are equipped with hydrostatic transmission which gives the driver complete driving control. The speed is controlled using the forward or reverse pedals. The models described in this workshop manual have different types of transmission. All the machines have rear-wheel drive.

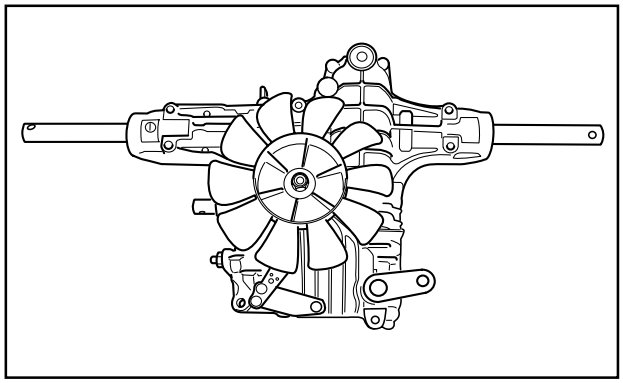




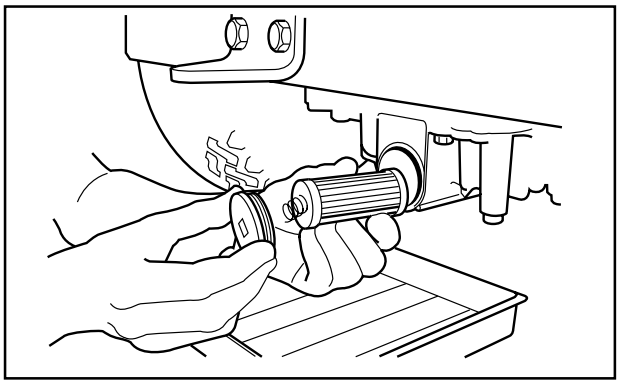
Hydrostatic transmission K46 for Rider 15V2 seen from above. The illustration shows the transmission with oil tank but without cooling fan.



Hydrostatic transmission K66 for Rider Pro 18 seen from above. The diagram shows the transmission without cooling fan.



Hydrostatic transmission K62 for Rider Pro 15 with fitted cooling fan. The externally visible difference compared to K66 is that the oil drainage with filter is at the rear of the K66.

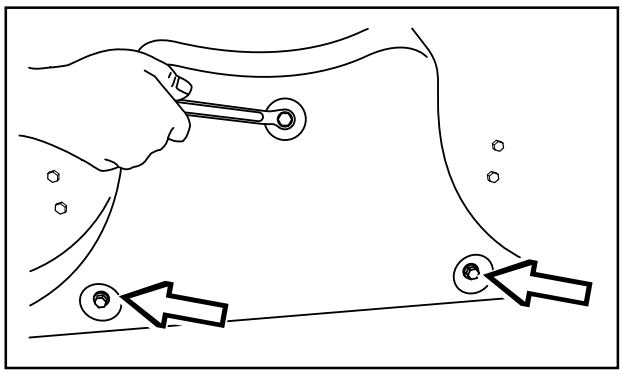


Oil drain with filter on K66.

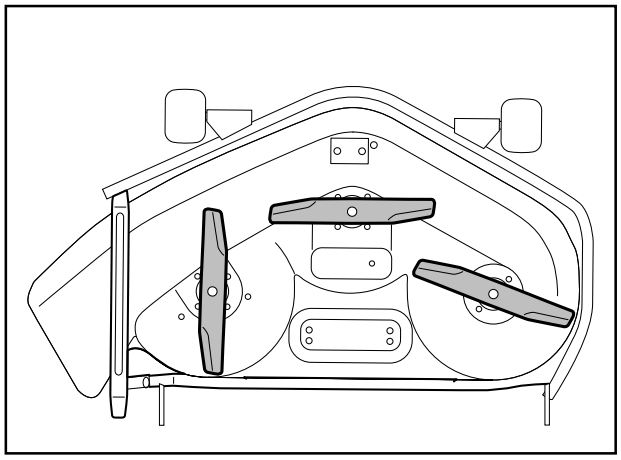
Mowing deck

The entire Rider series is equipped with front-mounted mowing decks to ensure effective cutting even in confined areas.

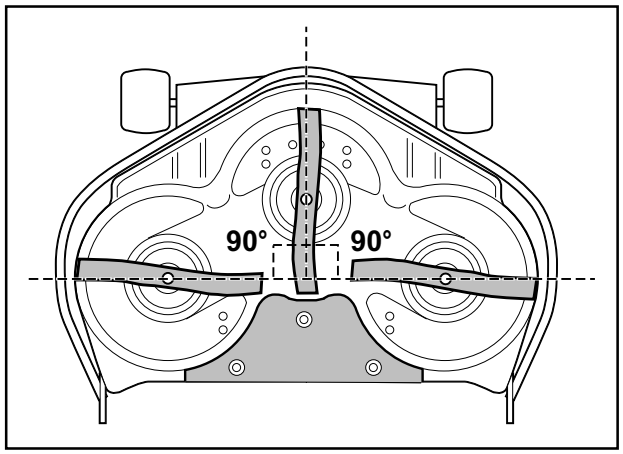
Rider 15V2, Pro 15 and Rider Pro 18 can be supplied with different types of cutting unit: side ejection, rear ejection, BioClip or Combi. The Combi unit functions as a BioClip unit when a BioClip plug is fitted, but can be changed to rear ejection by removing the BioClip plug.



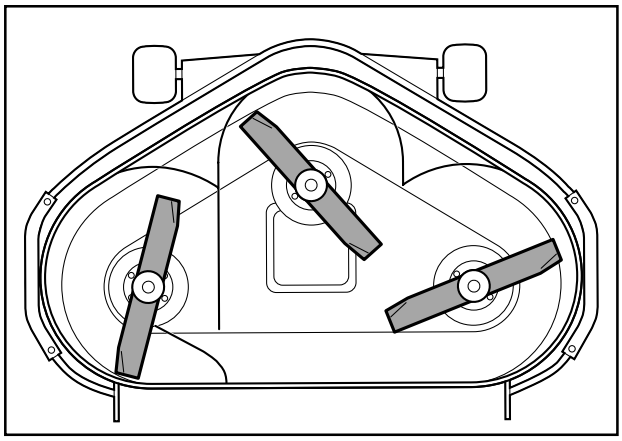
Removing the BioClip plug



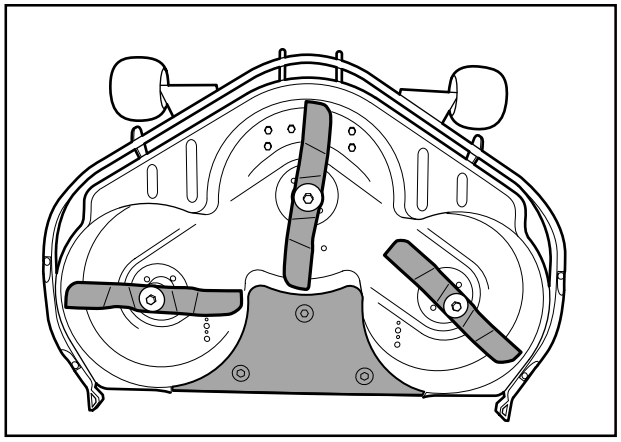
Sida 97



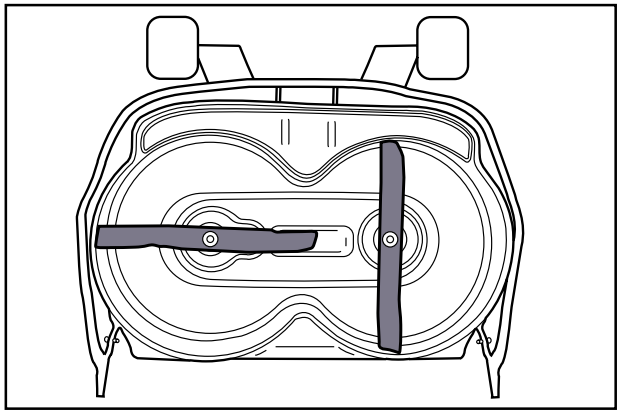
Combi 103



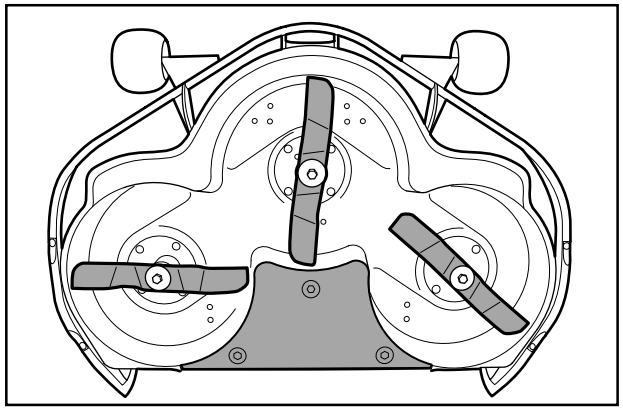
Mowing deck with rear ejection



Combi 112



BioClip 90



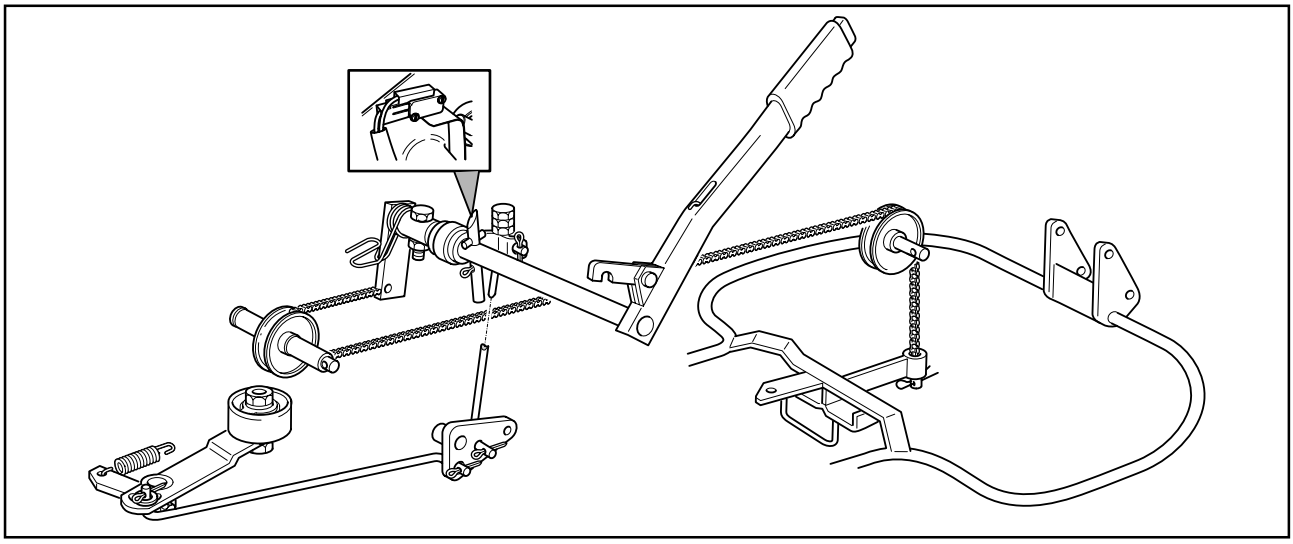
Combi 122

The cutting unit is raised and lowered using the mechanical lifting lever, which actuates a shaft that rotates.

When the shaft rotates, the chain that is secured in an arm on the inner end of the shaft raises or lowers the tool frame.

When lowering the unit, the two connecting rods, via the three-point link, will alter the belt adjuster so that the drive belt is tensioned and the blades begin to rotate.

When the attachment is raised the microswitch in the safety circuit is actuated.

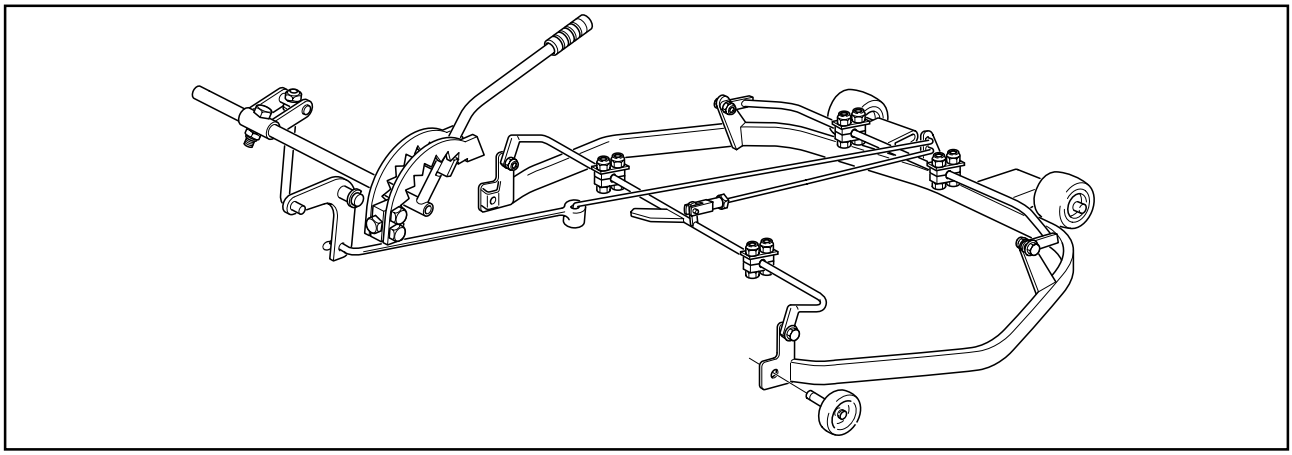


The attachment's lifting device Rider 15V2 and Pro 15

The cutting unit is suspended at the rear with the lug in a U-bracket on the tool frame. The front of the tool frame is linked to a bracket on the attachment. The front rollers are supported against the ground, for example, when turning when the attachment tends to lean. The rollers on the rear section of the protective frame are used when removing and fitting the cutting unit or moving it to the service position. Otherwise, when dismantling, the rear of the attachment would fall directly to the ground when the lug on the rear axle releases its grip.

The mowing height is adjusted using the lever, which has a catch for the different mowing height positions. The setting for the mowing height range is located on the same axle, see 'Adjustment of the mowing height range'. Two connecting rods, via an angular link, activate the protective frame around the cutting unit and raise or lower the cutting unit cover within the cutting height range.

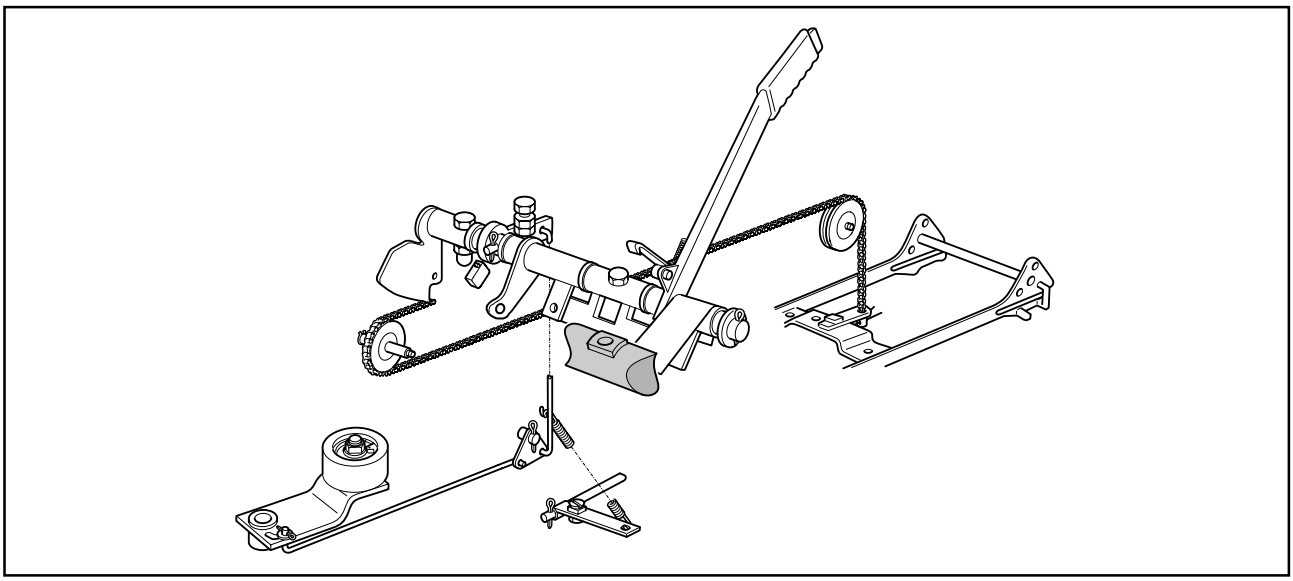
There are two struts on the top of the cutting unit cover. The upper one is coupled between the horizontal connecting rod and the tongue of the forward perpendicular shaft on the top of the cutting unit cover. When the shaft is rotated, it will raise or lower the cutting unit cover in relation to the protective frame. The lower strut (parallel strut) is connected between the front and rear transverse axles, so that even the rear axle rotates in the same way as the front axle. There is an adjuster on the parallel strut to adjust the cutting unit cover's parallelism with the ground. See 'Checking and adjusting the cutting unit's parallelism'.



Cutting height adjustment Rider 15V2 and Pro 15

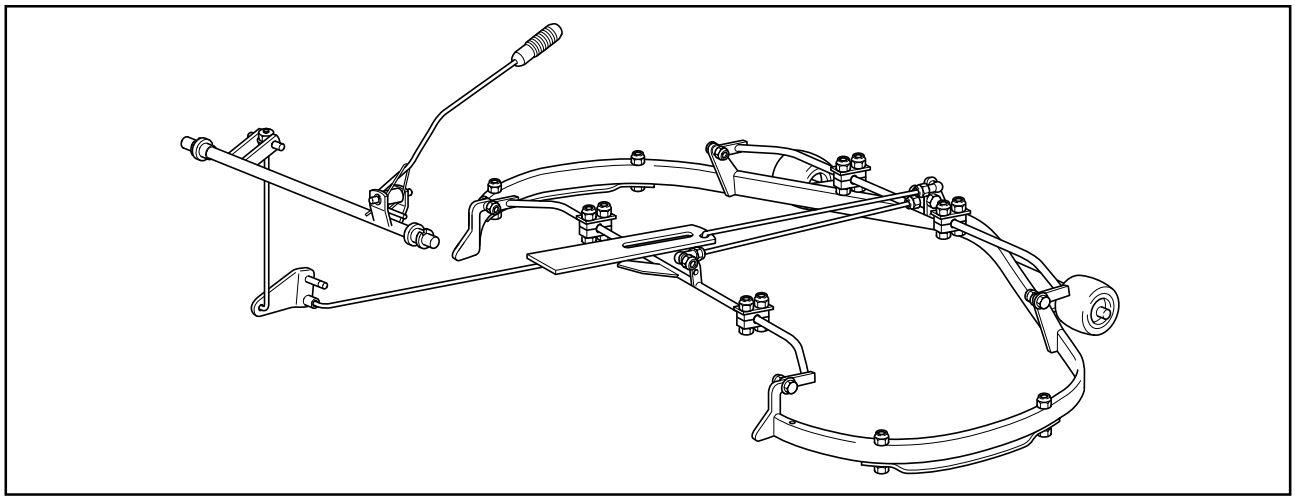
The cutting unit on the Pro 18 can be raised or lowered according to the same principles as for the smaller machines, but the system is of a different design.

Pro 18 has a blade brake that is not present in the Rider 15 machines. The blade brake is connected to the vertical connecting rod by a spring.



The attachment's lifting device Pro 18

The cutting height adjustment system also differs between the Pro 18 and the smaller machines. For example, Pro 18 has 7 cutting height positions while Rider 15 has 9.



Cutting height adjustment Pro 18

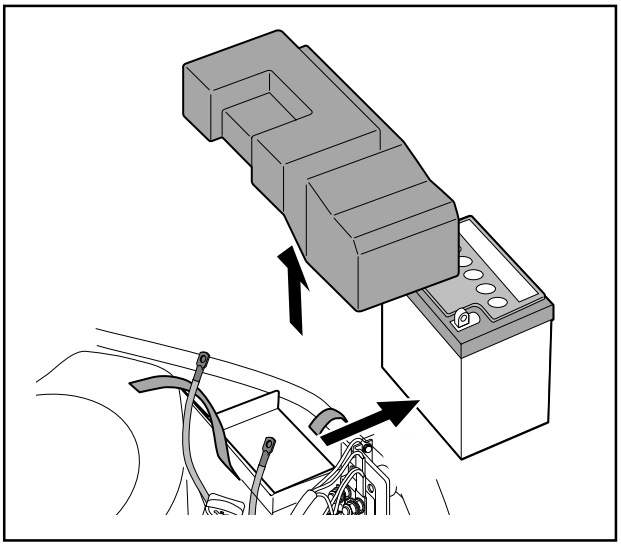
Reparation instructions

Removing engine

1

Remove the engine hood on Pro 18. On Rider 15 it can be left on.

2



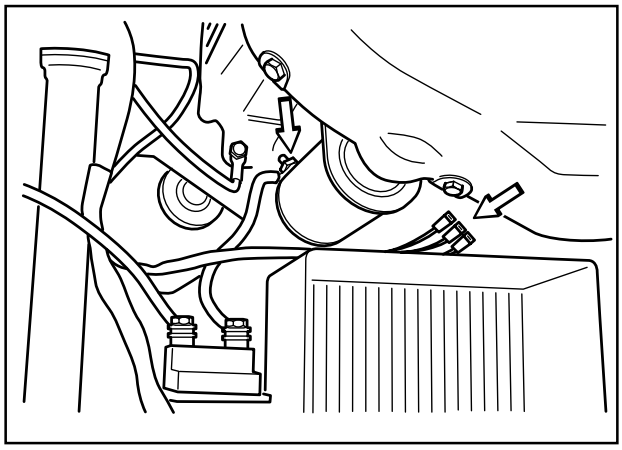
Release the battery's fixing belt. Remove the safety guard.

IMPORTANT INFORMATION

Brace the screws for the battery cables to avoid exposing the terminals to stress.

Release the battery cable connections. Now lift out the battery.

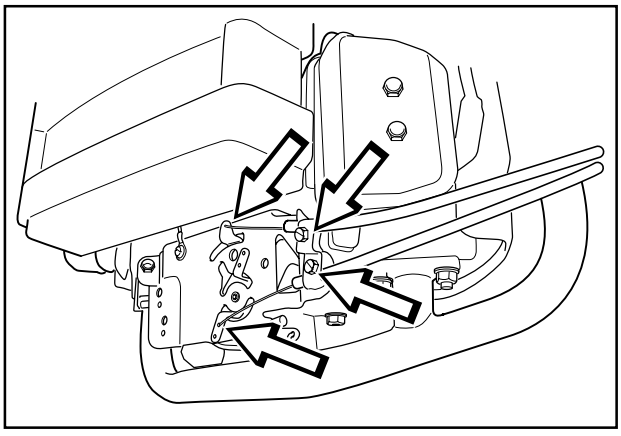
3



Remove the cable which runs between the starter relay and starter motor from the starter motor.

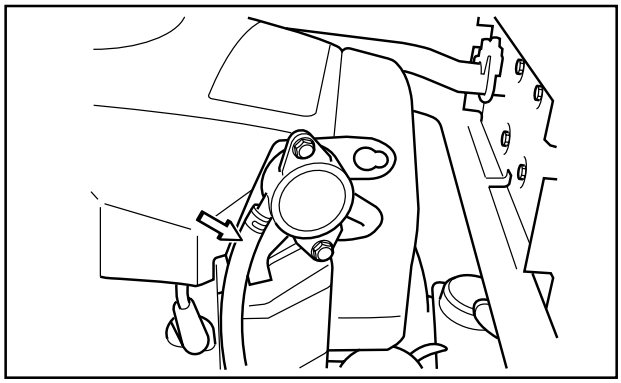
Mark up and remove the engine's electrical connections.

4



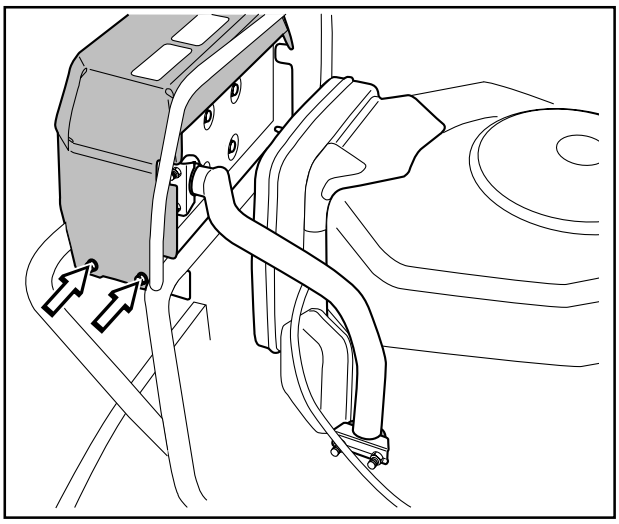
Remove the clamps which hold the throttle and choke wires. Unhook the wires from their attachment in the carburettor.

5



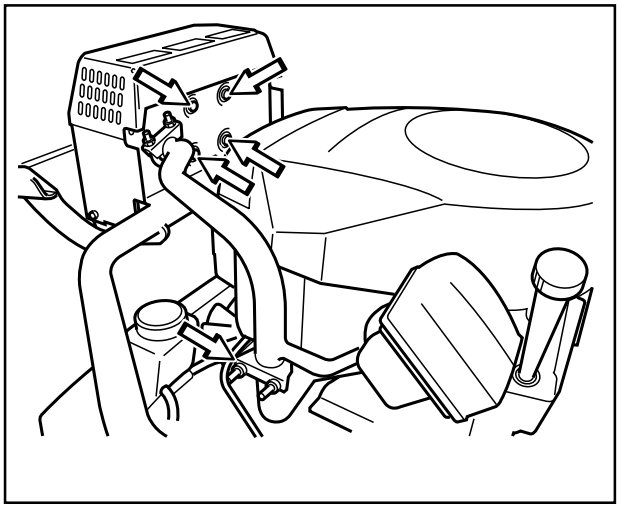
Remove the fuel line hose clamp from the fuel pump and pull the fuel line downwards. Fix up the hose so that fuel will not leak out.

6



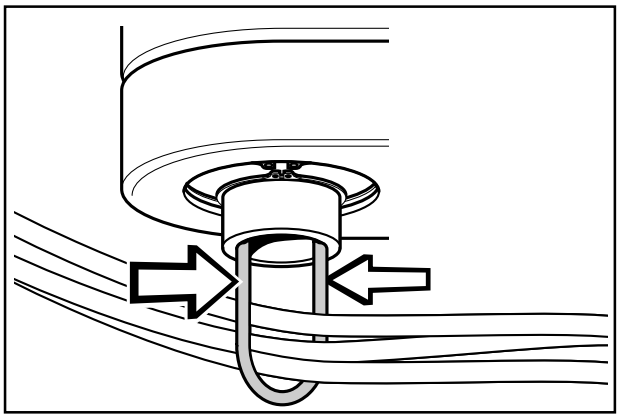
Remove the cover plate over the silencer (two screws on either side of the silencer) and lift out the plate.

7



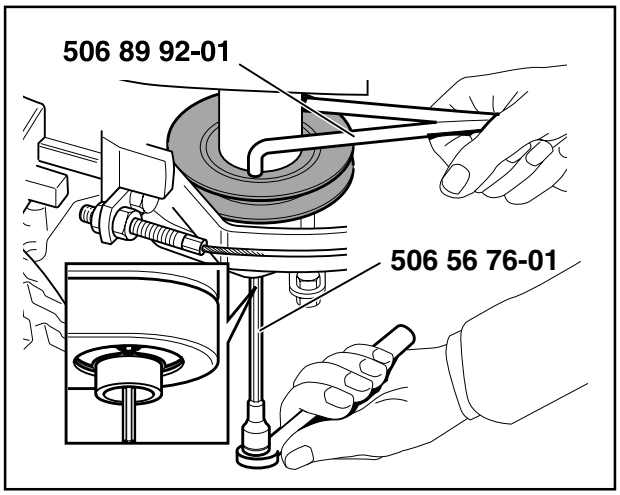
Release the exhaust pipe clamps and silencer's four retaining bolts. Now remove the silencer, exhaust pipe and the accompanying pulse air valve.

8

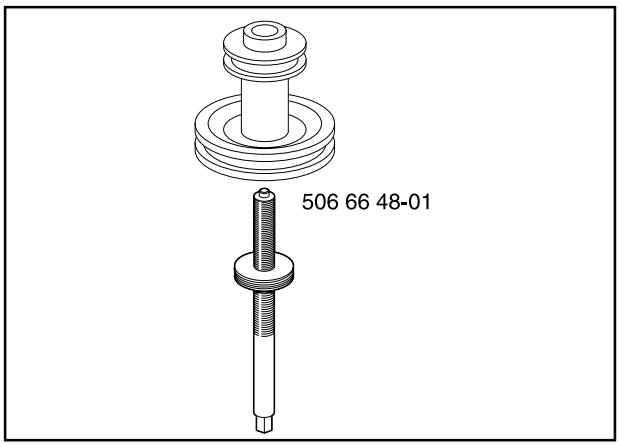


Clamp together the wire holder under the engine pulley with a pair of flat pliers and pull the wire holder downwards.

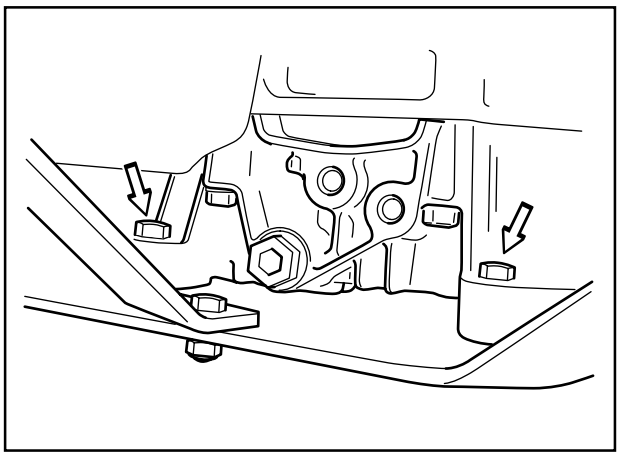
9



Insert tool no. 506 56 76-01 into the centre of the engine pulley. Unscrew and remove the socket head cap screw which holds the pulley and the engine axle together. Use tool no. 506 89 92-01 as a holder-on. Remove the pulley from the engine axle. Use the 506 66 48-01 puller if necessary.

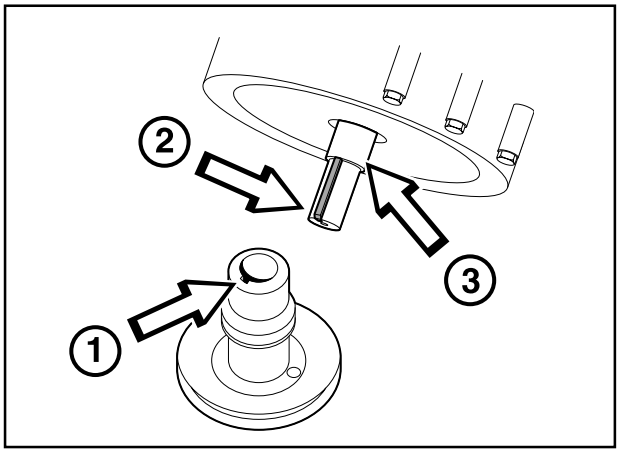


10



Note where the battery's negative cable is connected. Disconnect it from the engine if necessary. Remove the engine attachments, two on each side of the engine, and remove the engine from the mower.

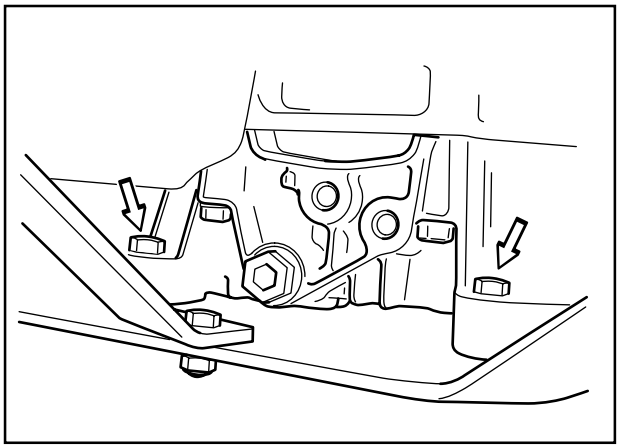
Replacing engine



IMPORTANT INFORMATION

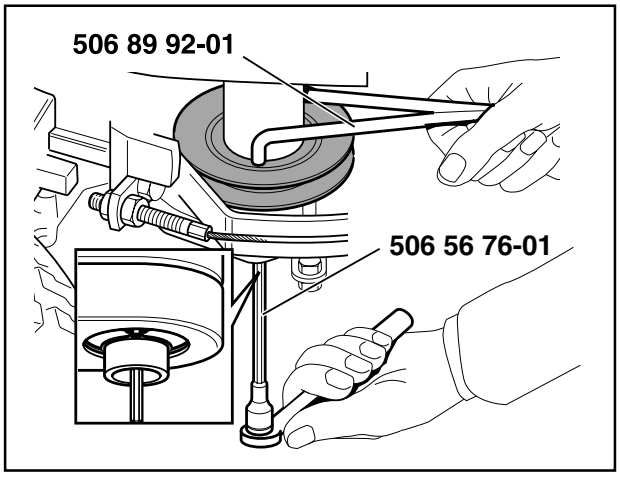
When installing the engine, it is important that the pulley groove (1) is in a position so the outgoing axle key (2) fits into the groove (see diagram). Also check that both spacing collars (3) and the key (2) are firmly attached on the engine axle. Grease the engine axle.

1



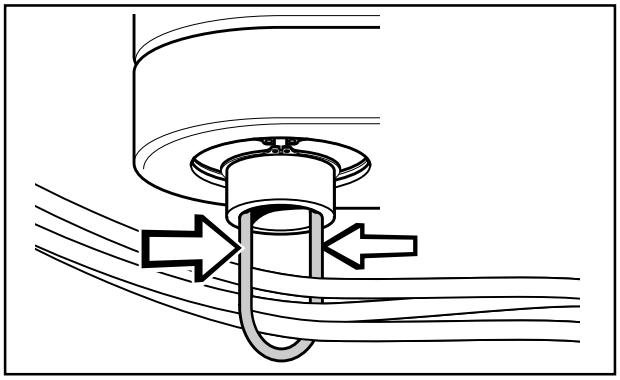
Lower the engine into place.
Connect the battery's negative cable. Tighten the engine fixtures (two on each side of the engine) with a torque of 20-25 Nm / 14-18 lbf. ft.

2



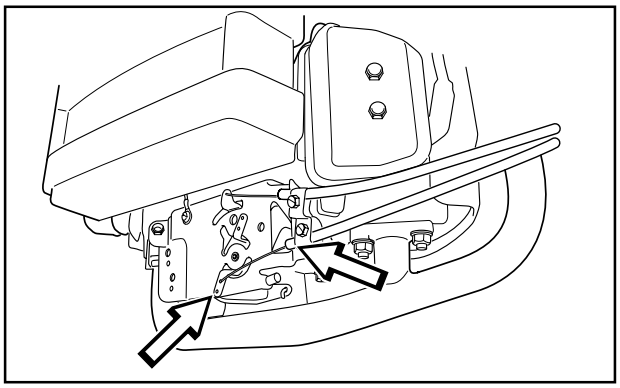
Position the pulley with tool no. 506 56 76-01 and tighten it with moment (70-80 Nm/50-56 lbft). Use tool no. 506 89 92-01 as a holder-on.

3



Place the wires in the wire holder. Make sure that the hydrostatic transmission wire is at the bottom. Clamp together the holder and bring it from underneath through the centre of the belt tensioner until it hooks over the top edge of the tensioner.

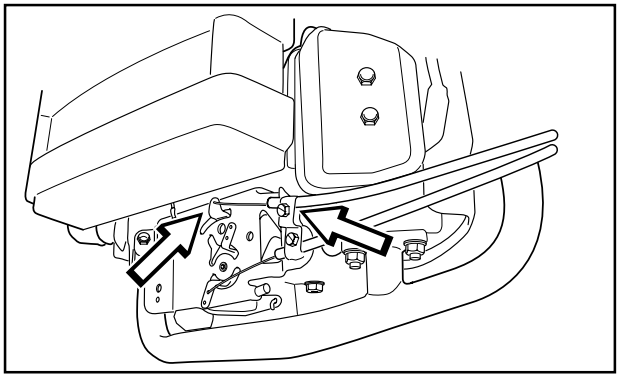
4



Attach the throttle cable to the carburettor and fit the cable clip without tightening it. Make sure that it goes into the proper hole, see illustration.

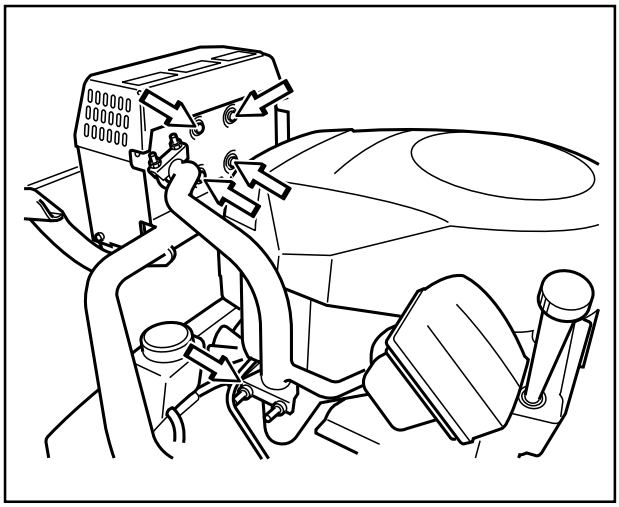
Push the choke control to full choke position. Pull wire's outer casing as far as possible to the right and tighten the wire clamp.

5



Hook the throttle wire onto the carburettor and fit the wire clamp without tightening it. Push the throttle control to full throttle position. Pull the wire's outer casing as far as possible to the left and tighten the wire clamp.

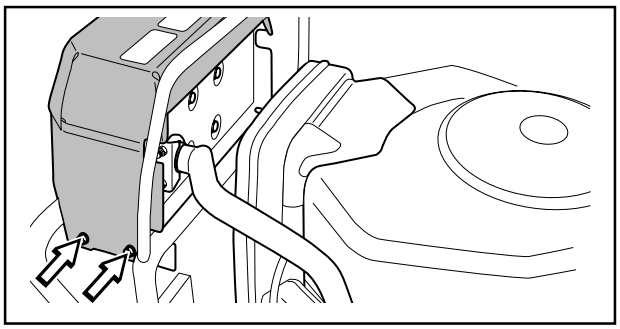
6



Attach the silencer and exhaust pipe and tighten the holder screws and pipe clamps.

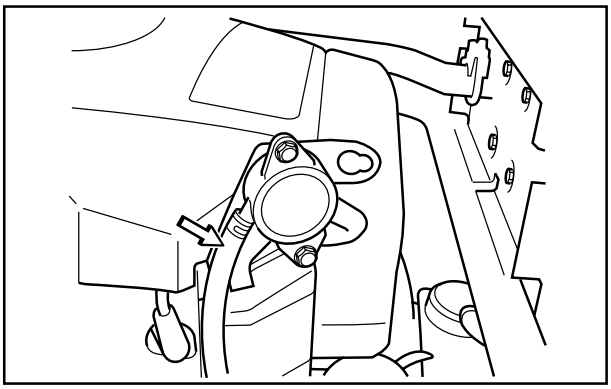
Rider 15V2 does not have Pulse air filter, as shown in the illustration.

7



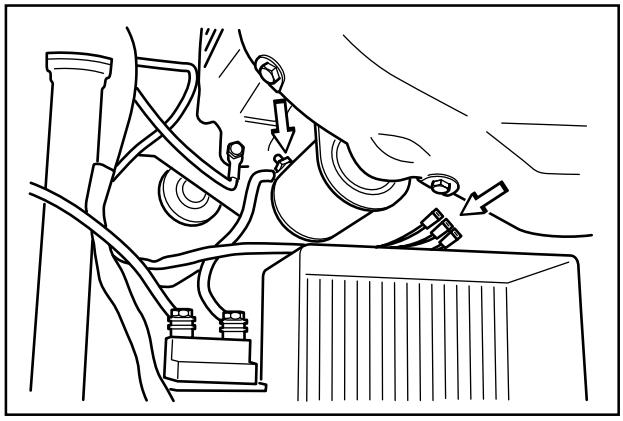
Securely fasten the protective plate over the silencer, two screws on each side of the silencer.

8



Press the fuel line securely against the fuel pump and fit its hose clamp.

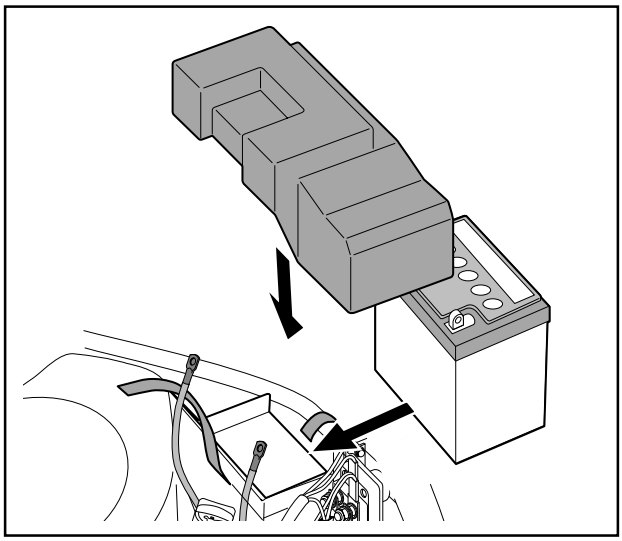
9



Screw tight the cable between the starter motor and starter relay.

Attach the engine's electrical connections.

10



IMPORTANT INFORMATION

Brace the screws for the battery cables to avoid exposing the terminals to stress.

Lift the battery into place and fasten the cable connections and safety guard. Tighten the catching belt.

Fuel tank

Removal

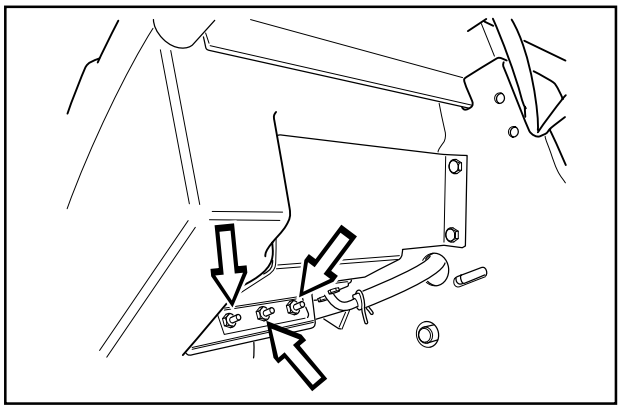
WARNING!
Petrol is highly flammable and environmentally hazardous. Exercise caution to avoid fire and spillage.

1
Place an appropriate container to catch the petrol. The tank holds approximately 7 litres and 17 litres in the Pro 18.

2
Empty the petrol tank by removing the hose from the connector under the tank.

If you do not wish to empty the tank, you can pinch the hose with lockable welding pliers and then remove the hose and hose clamp from the fuel filter's lower connector. You must then be sure to keep the hose opening higher than the fuel level in the tank.

3
Remove the three screws that fix the tank to the bracket. Lower the tank and pull out the hose through the frame of the machine (if it has been loosened by the fuel filter).



Rider 15V2 and Pro 15

Fitting

1
It is easier to work if you empty the tank before fitting. Insert the hose into place and attach it to the fuel filter with the hose clamp. Make sure that the hose cannot be chafed or rubbed.

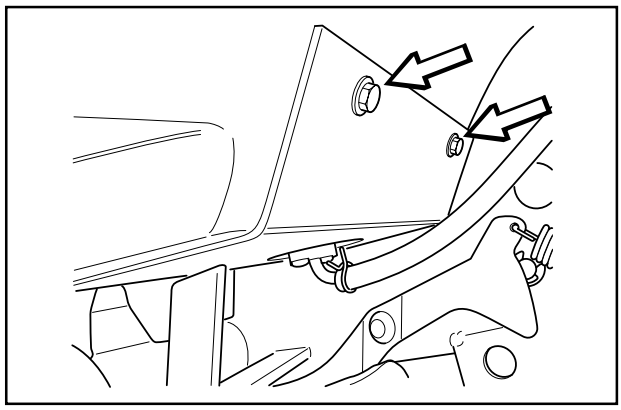
2
Position the tank in the bracket, and secure with the screws.

3
Fit the fuel hose and the hose clamp to the connector under the tank as required. Fill with petrol and check that there are no leaks.

IMPORTANT INFORMATION

Overly long screws can damage the tank and cause fuel leakage on the Pro 18.

Only use screws as stated in the spare parts catalogue.



Pro 18. A screw hidden on the front of the console.

Changing the oil

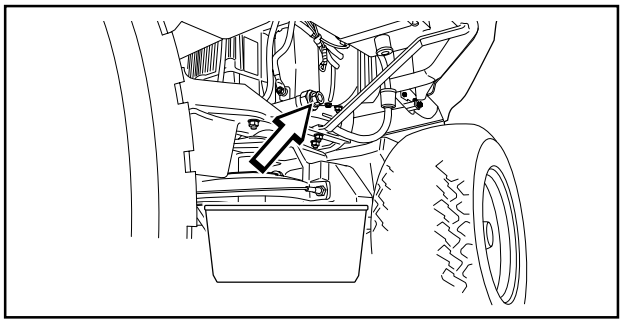
The engine oil should be replaced after the first five hours of running time, see service chart. Thereafter it should be replaced every 100 hours of running time.

WARNING!
Engine oil can be very hot if it is drained off directly after the engine is stopped. Therefore allow the engine to cool down first.

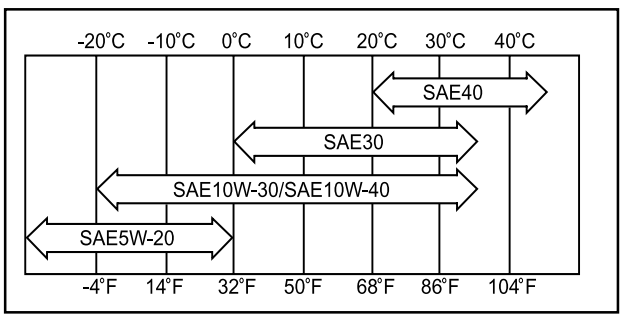
IMPORTANT INFORMATION

Used engine oil and oil filters are an environmental hazard and must not be disposed of on the ground or in the natural environment. They should always be disposed of at an appropriate disposal location.

Avoid skin contact and wash any spillage with soap and water.

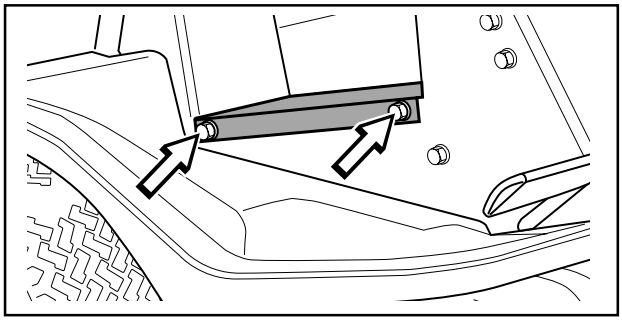


Place a container under the drain plug on the left side of the engine.
Remove the dipstick and drain plug. Let the oil drain into the container.
Refit the drain plug and tighten it.
Fill with oil up to the “FULL” mark on the dipstick. The dipstick should **not** be screwed down when checking.
Pour the oil into the same hole the dipstick goes in.
Use engine oil SAE 30 or SAE 10W-30 alternatively 10W-40 grade SF-SS (above 0 °C / +32 °F). Above + 20 °C / +68 °F, SAE 40 can be used. Below 0 °C / +32 °F, SAE 5W-20 should be used. The engine takes 1.5 litres of oil excluding filter (1.7 litres including filter).
Run the engine until warm, then check that there are no oil leaks from the drain plug.



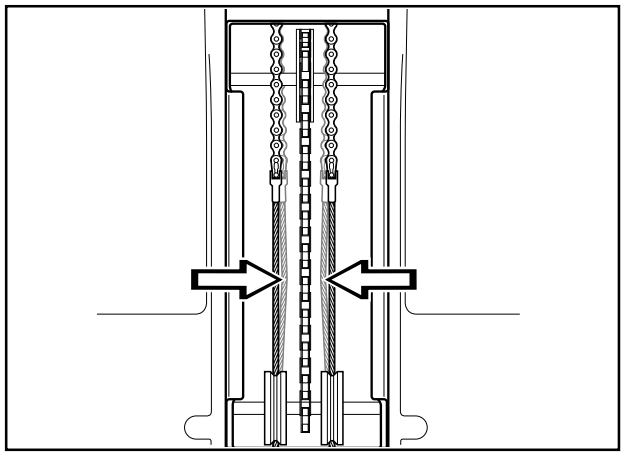
Checking and adjusting steering wires

1



Remove the frame plate by releasing the screws (two on either side). Pro 18 has two screws to the power steering housing.

2

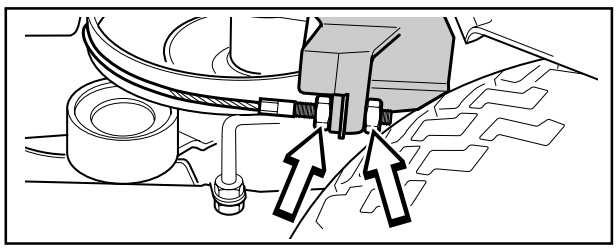


Ensure that the cables are properly situated under the steering cable pulleys in the frame tunnel.

The tension is checked by squeezing together the wires (as shown in the diagram). Without having to apply too much force, the wires should be able to be squeezed to half the distance between them.

Change the cable if it has a damaged strand causing loose threads to protrude.

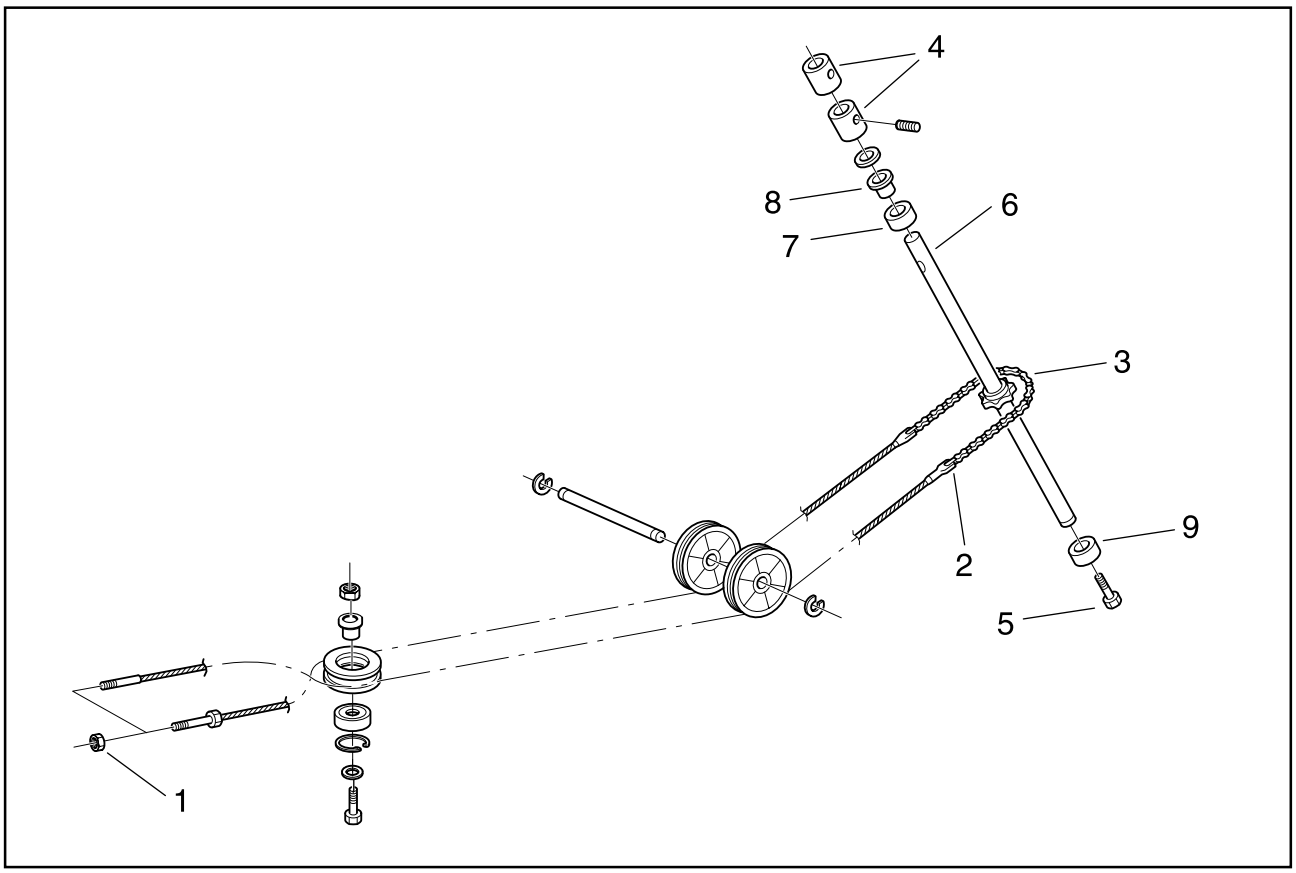
3



Hold the wire so it does not twist.

Stretch the wires by tightening the adjuster nuts (one wire on each side of the ride-on mower). Do not overtension them, they should only be tightened up to the steering rim. Stretch both wires equally so that the steering wheel position is not changed.

Check the wire tension as set out in point 2 after you have made the adjustment.



Replacing steering wires

1. Release the steering wires' rear attachment (1).
2. Remove the frame plate.
3. Release the steering wires' front attachment (2) at the steering transmission chain (3) and pull the steering wires out throught the frame.

   Note. If the old wires are still complete, the new wires can be attached to the old ones when they are pulled out through the frame, the new wires will then come automatically into place.
4. Ensure that the steering wheel is in the centre position when the rear wheels are centred. Re-set the chain on the steering column's sprocket or adjust the rear fixture (1) for the steering cables as needed.

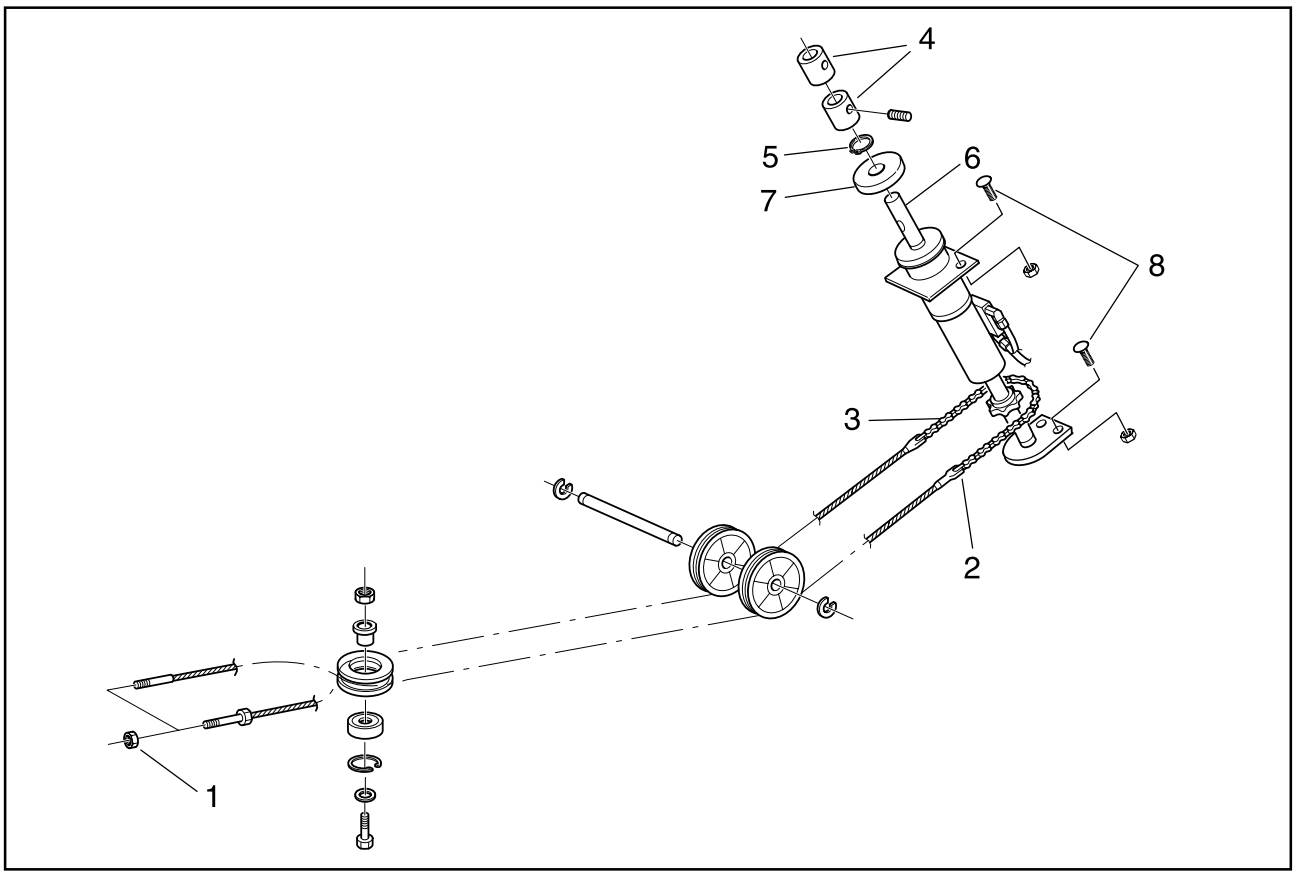
   Hold the cables with, for example, a wrench when mounting so that they do not twist.

   Once the new wires are in place, check the wire tension (see "Checking and adjusting steering wires").

Removal/installation of steering axle

Rider 15V2 and Pro 15

1. Release the steering wires' rear attachment (1). Remove the frame plate.
2. Remove the steering wheel and steering column by releasing the lock nut and unscrewing the locking screw, lift the steering wheel and steering column upwards.
3. Remove the two steering wheel rod carriers (4).
4. Unscrew the bolt (5) from the bottom end of the steering column.
5. Pull the steering axle (6) upwards and move the lower part of the axle backwards to remove the steering transmission chain (3).
6. Move the upper bearing (7) uppwards until it goes free from the steering axle (6). If the bearing is to be replaced, the bushing (8) must be knocked out of the bearing.
7. Slide the bearing (9) off the bottom end.
8. Take the steering axle out (6) downwards.
9. To assemble the steering axle, the reverse order is applied. For assembly purposes, the two steering wheel rod carriers (4), are tightened with moment (5–10 Nm/3,5-7 lbft).

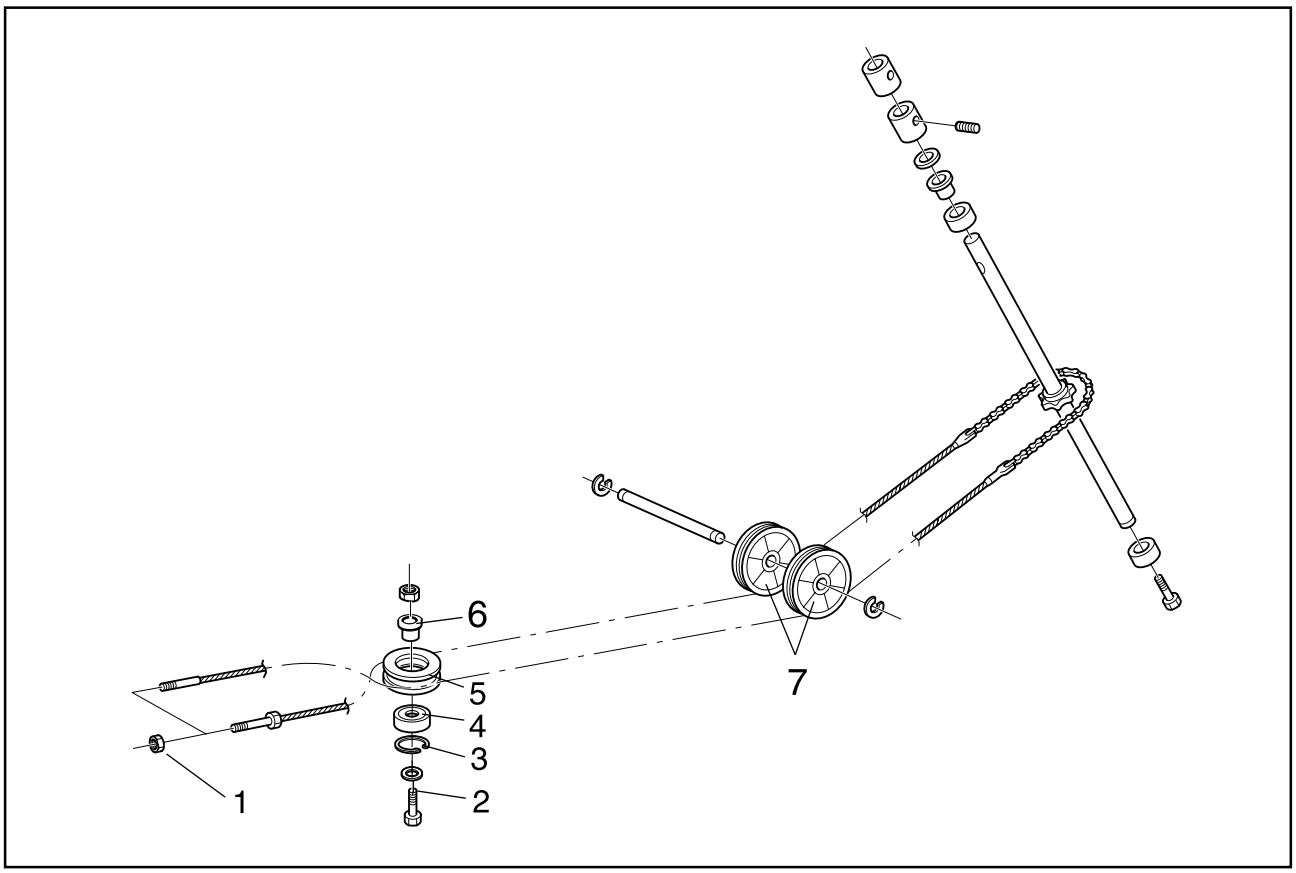


Removing/Fitting the Power Steering

Rider Pro 18

1. Remove the cutting unit.
2. Loosen the steering cables' rear mount (1).
3. Remove the frame plate. Two screws for the power steering housing.
4. Remove the steering wheel and steering rod by loosening the lock nut and unscrewing the stop screw, and then lifting the steering wheel and steering rod upwards.
5. Remove the lighting, the protective cover for the power steering housing and the rubber bellows.
6. Remove the circlip (5) and the bellows holder (7) on the top of the power steering.
7. Clean, see 'Hydraulic System\Working Methods'. Loosen the hydraulic hoses from the power steering.
8. Remove the steering column's two drive discs (4).
9. Remove the four screws (8) that hold the power steering's brackets in the power steering housing.
10. Pull the power steering (6) upwards and move the lower section backwards in order to force off the steering chain (3).
11. To fit the power steering, follow the instructions in the reverse order. The steering column's two drive discs (4) should be torque tightened during fitting (5-10 Nm/3.5-7 lbf. ft.)

    Ensure that the steering wheel is in the centre position when the rear wheels are centred. Re-set the chain on the power steering sprocket or adjust the rear mounting for the steering cables as needed. Hold the cables with, for example, a wrench when mounting so that they do not twist.
12. After mounting, the cable tension should be checked (see 'Checking and Adjusting the Steering Cables').
13. Bleed the hydraulic system of excess air.



Removal/installation of wire wheel

1. Remove the frame plate.
2. Detach the steering wires' rear attachment (1) .
3. Remove the screw (2) and detach the wire wheel (5).
4. Remove the bearing's circlip (3) and knock out the bearing (4).
5. To install the wire wheel, the reverse order is applied.

   The screw (2) is to be mounted in the rear hole on the frame. The bushing (6) is to be placed between the frame and the cable pulley.

Ensure that the cables are properly situated under the steering cable rollers (7) in the frame tunnel.

Ensure that the steering wheel is in the centre position when the rear wheels are centred. Re-set the chain on the steering column’s sprocket or adjust the rear fixture (1) for the steering cables as needed.

Hold the cables with, for example, a wrench when mounting so that they do not twist.

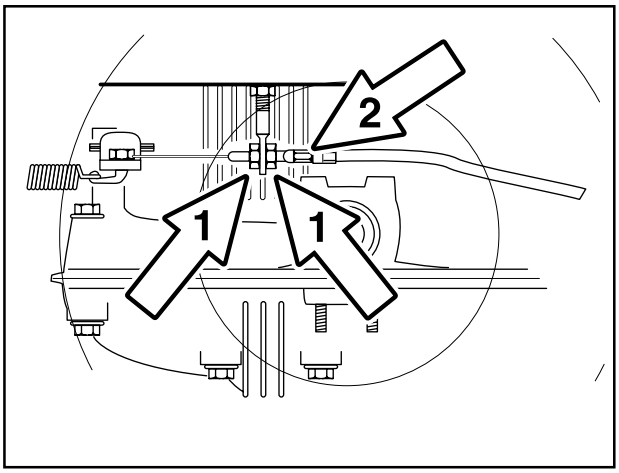
After installation, check the wire tension (see “Checking and adjusting steering wires”).

Checking and adjusting brake wire

Check that the brakes are correctly adjusted by placing the rider on a slight downhill slope with the clutch disengaged and activating the brake. If the ride-on mower does not stand still, the brake needs to be adjusted.

The brake is adjusted in the following way:

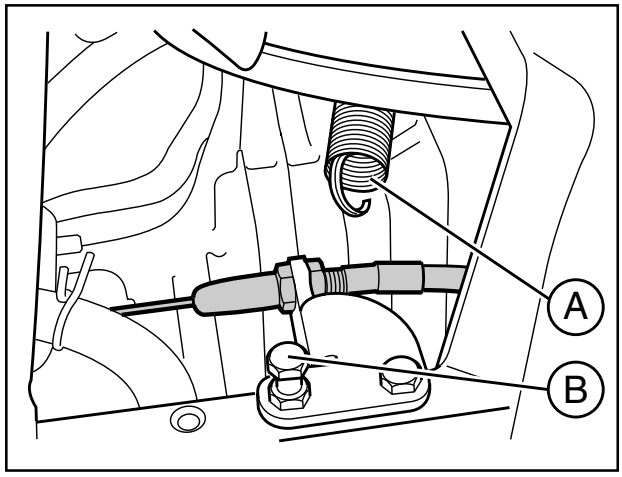
Rider 15V2



1. Remove the transmission cover.
2. Loosen the locking nuts (1).
3. Tension the cable using the adjuster screw (2) until the play in the cable disappears.
4. Tighten the locking nuts (1).
5. The brake should be checked again after the adjustment has been made.
6. Replace the transmission cover.

WARNING!
A badly adjusted brake can lead to reduced braking capacity.

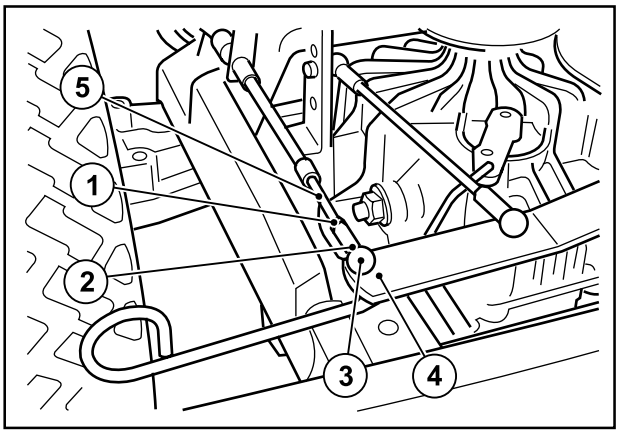
Rider Pro 15 and Pro 18



1. Remove the transmission cover.
2. Unhook the spring (A) from the screw (B).
3. Check that the parking brake is not applied.
4. Set a clearance of 1 mm between the casing and adjusting screw when pulling the casing. Adjust with the nuts on the adjusting screws.
5. Do not tighten the nuts too hard to avoid damaging the adjusting screws.
6. Replace the spring (A).
7. Check that the brake functions.
8. Replace the transmission cover.

Checking and adjusting throttle control

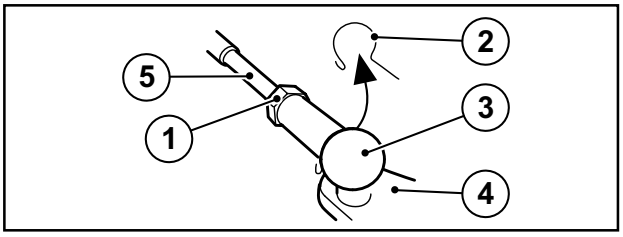
Rider 15V2



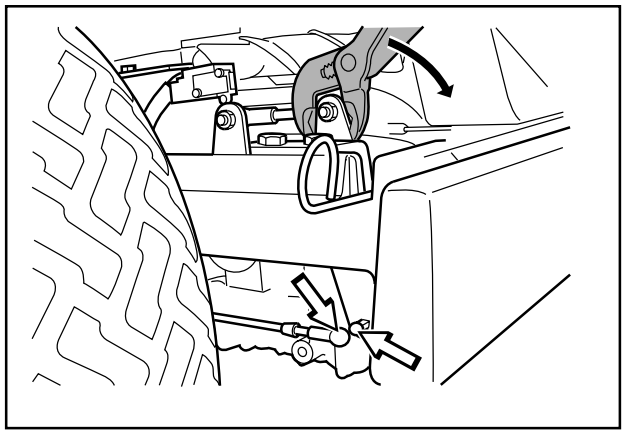
The hydrostatic transmission cable (on the left side) is adjusted in the following manner:

1. Remove the transmission cover.
2. Loosen the lock nut (1) on the ball joint.
3. Push the locking spring (2) forward far enough for the socket (3) to be lifted from the ball on the lever arm (4).
4. Depress the accelerator pedal completely and use a screwdriver to move the lever arm (4) forward as far as possible.
5. Adjust the socket (3) position on the connecting rod (5) so that it fits exactly over the ball on the lever arm. Fit the socket on the ball.
6. Lock the adjustment in place with the lock nut (1) and push the locking spring (2) into place.

IMPORTANT INFORMATION
Check that the locking spring goes through the hole in the spherical socket.



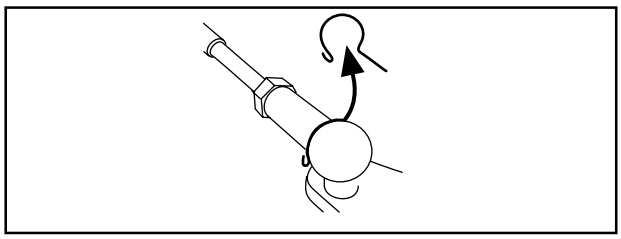
Rider Pro 15 and Pro 18



Adjust the hydrostatic wire (on the left-hand side) as follows:

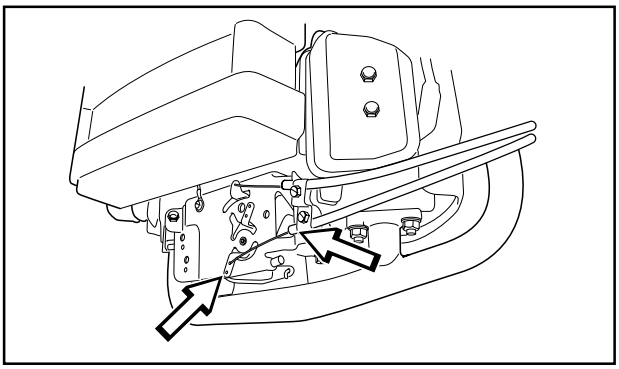
1. Remove the transmission cover.
2. Prise apart the lower ball joint, which is held together by a spring clip.
3. Make sure the forward drive pedal is fully depressed.
4. Raise the vertical arm as far as it will go and check that the ball and socket that make up the lower ball joint are level with each other.
5. If necessary, adjust the socket along the wire so that it is perfectly level with the ball on the lever.
6. Reconnect the ball joint.
7. Secure the ball joint with the spring clip.
8. Tighten the locking nut to lock the socket on the wire.

IMPORTANT INFORMATION
Check that the locking spring goes through the hole in the spherical socket.



Locking spring for the linkage.

Checking and adjustment of the throttle wire

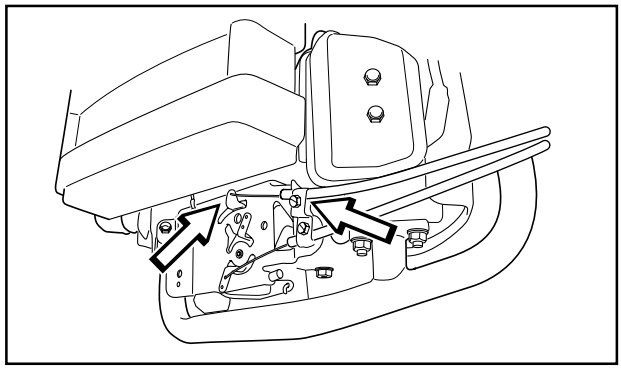


Check that the engine responds to the throttle control and that the correct engine speed is achieved at full throttle.

If adjustment is necessary, adjust the lower wire as follows:

1. Release the clamping screw that secures the wire casing and set the throttle control to full throttle.
2. Check that the throttle wire is attached to the correct hole in the lower lever, see diagram.
3. Pull the throttle wire casing to the far left and tighten the clamping screw.

Checking and adjusting the choke wire



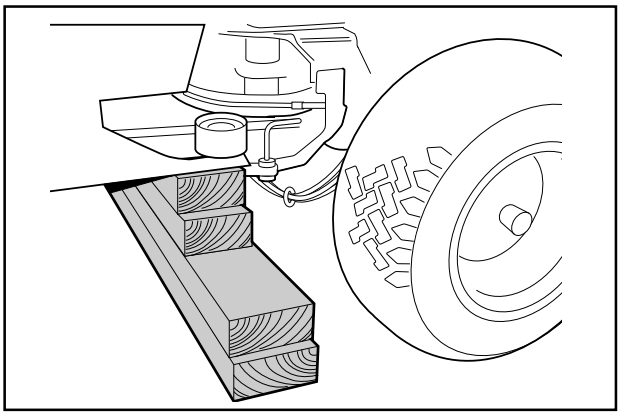
If the engine is producing black smoke or is difficult to start then the choke wire (upper wire) may be incorrectly adjusted.

If it is necessary to adjust the choke, proceed as follows:

1. Release the clamping screw that secures the wire casing and set the choke control to maximum choke.
2. Check that the throttle wire is attached to the upper lever, see diagram.
3. Pull the choke wire casing to the far right and tighten the clamping screw.

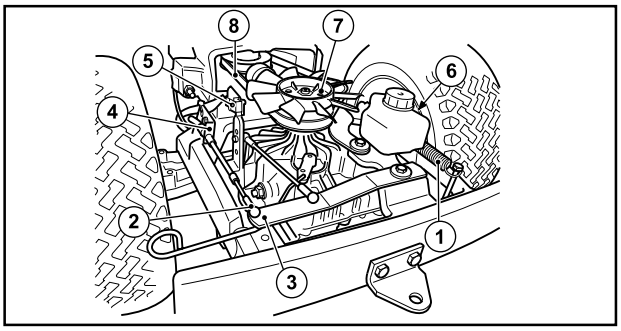
Replacing articulated steering bearing

1

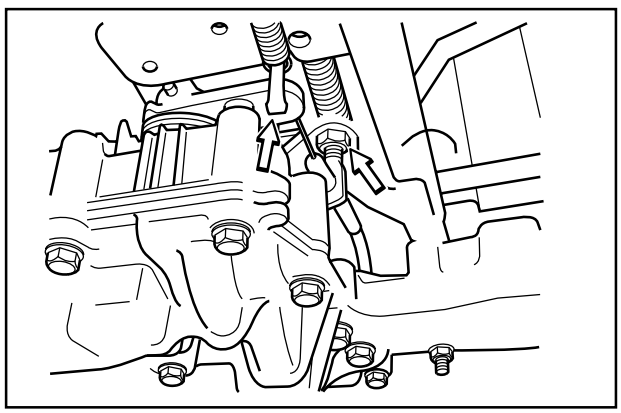


- Remove the engine according to the earlier description (see “Removing engine”).
- Block up the ride-on mower in front of the articulated steering.
- Work off the drive belts.
- Release the oil tank for the transmission and move it to one side to get at the brake wire.

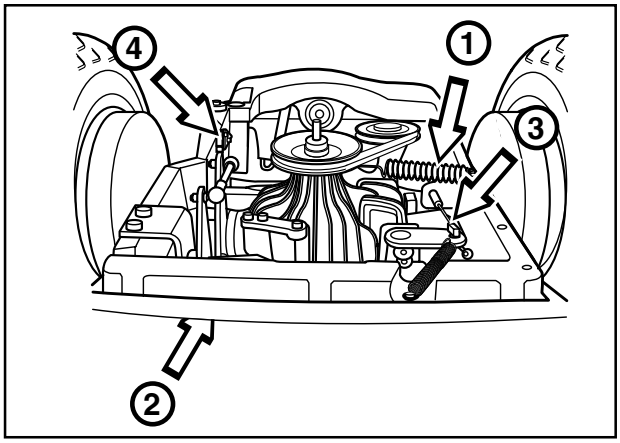
2 Rider 15V2



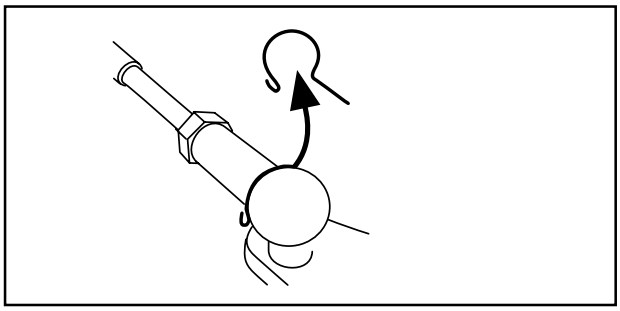
- Loosen the idler’s spring (1).
- Loosen the hydrostatic transmission cable (2) from the arm (3) and the casing from the fixture (4).
- Loosen the cable from the neutral position contact (5).
- Loosen the brake cable from the arm under the tank and the casing mounting from the rear frame (6).



2 Rider Pro 15 and Pro 18

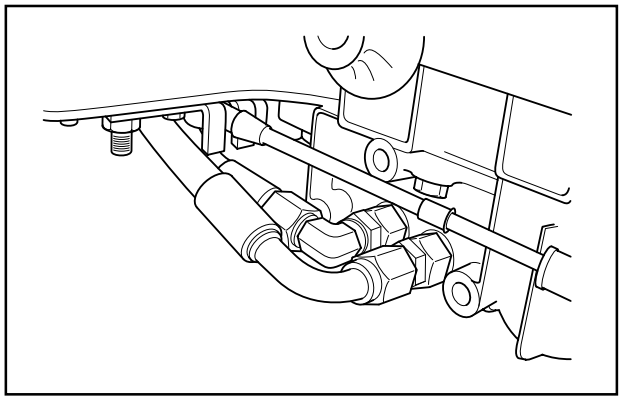


- Release the tensioning wheel spring (1).
- Remove the locking spring and release the locking spring on the linkage for throttle controll, on the underside, and release the wire from the underside of the axle (2).



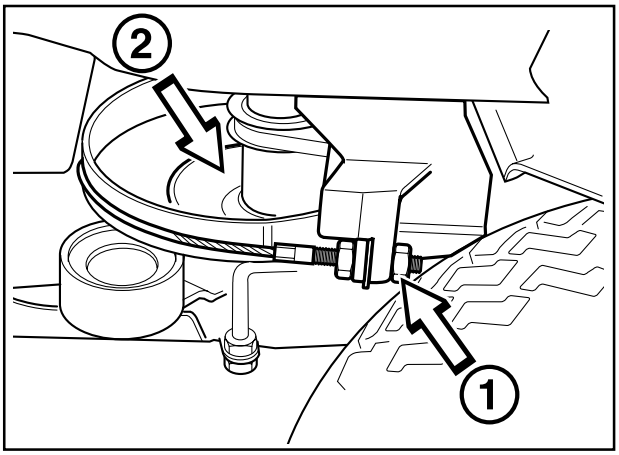
- Release the brake wire spring and nuts. Prise the wire off the brake arm (3).
- Remove the cable from the neutral position switch (4).

Only Rider Pro 18



- Clean, see ‘Hydraulic system\Working methods’.
- Loosen the hydraulic hoses from the hydrostatic transmission.

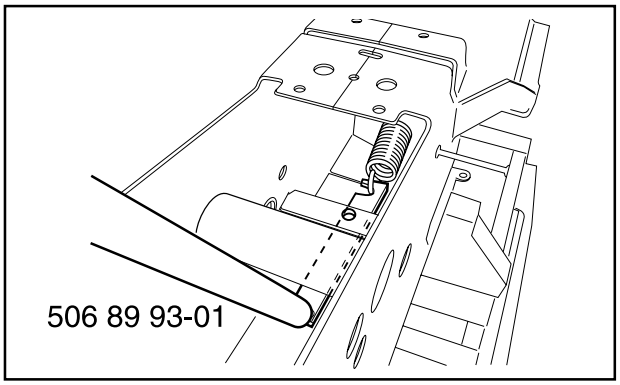
3



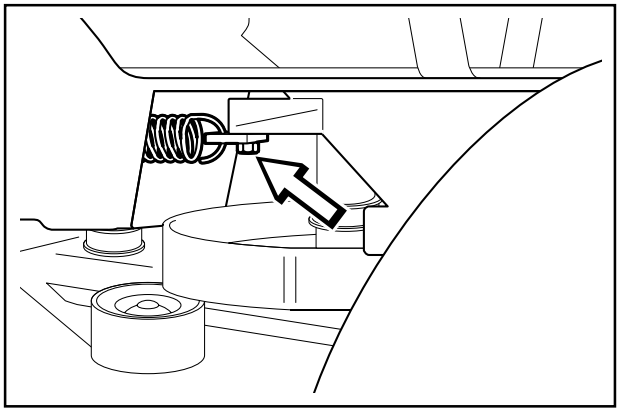
- Loosen the steering wires (1) and remove the steering rim.
- Remove the pulley (2). Move the lower part forwards, the upper part backwards and detach the pulley.

4

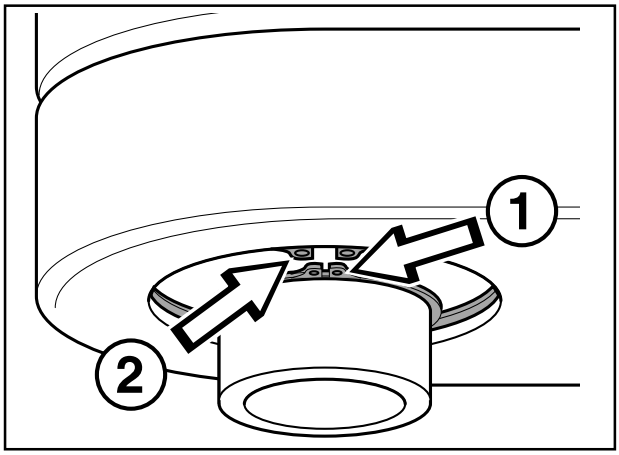
WARNING!
The articulation spring is strongly tensioned and can cause injury if it flies off. Wear safety glasses and gloves when removing/ attaching the spring.



Detach the articulation spring. This spring is heavily tensioned and should be released using tool 506 89 93-01 before the screw for the rear bracket is removed.

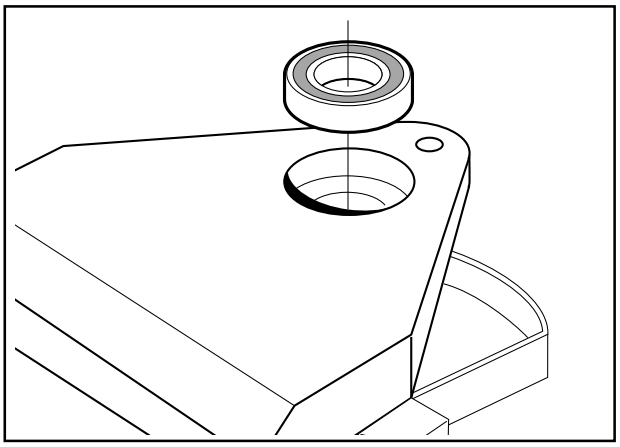


5



Remove the inner circlip (1) from the lower bearing (see diagram). The rear section is now loose and can be moved. Then detach the outer circlip (2) and take the bearing out downwards.

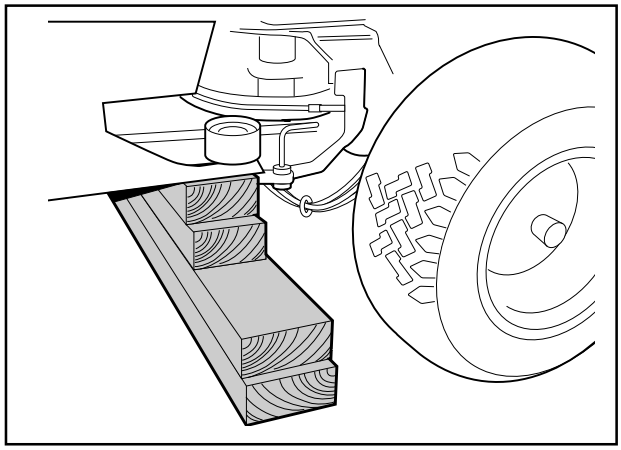
6



- Take the upper bearing out upwards, if it does not come out easily, it should be knocked out from below.
- Insert the new bearings and assemble the articulated steering in the reverse removal order.
- After re-assembly, the wire tension should be checked (see “Checking and adjusting steering wires”). Also check that the controls and cables are properly adjusted, (see ‘Checking and Adjusting the Brake Cable’ and ‘Checking and Adjusting the Accelerator’).
- Check the setting of the neutral position switch.

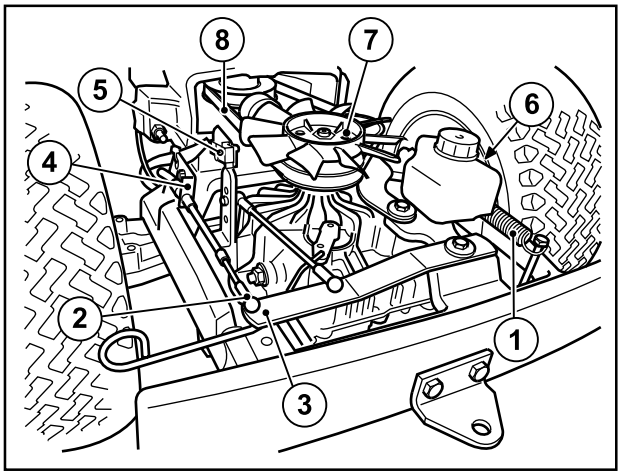
Removal of swing axle

1



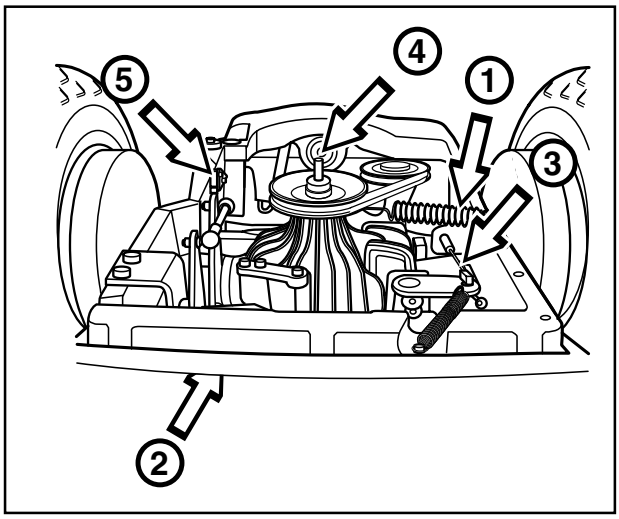
- Block-up the machine in front of the rear frame.
- Remove the transmission cover.
- Release the oil tank for the transmission and move it to one side to get at the brake wire.

2 Rider 15V2



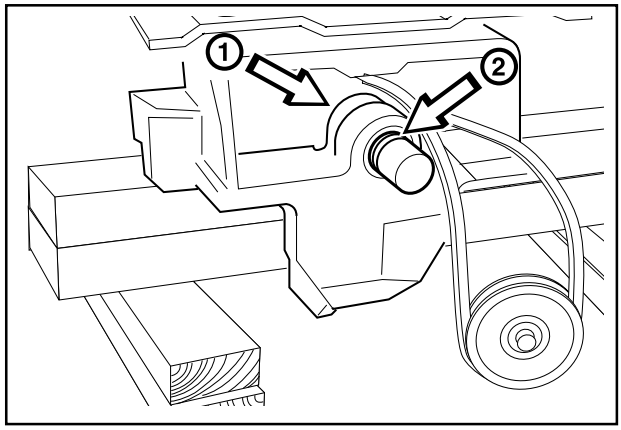
- Loosen the idler's spring (1).
- Loosen the hydrostatic transmission cable (2) from the arm (3) and the casing from the fixture (4).
- Loosen the cable from the neutral position contact (5).
- Loosen the brake cable from the arm under the tank and the casing mounting from the rear frame (6).
- Remove the circlip and lift off the hydrostatic transmission's fan (7).
- Remove the rear belt (8).
- Remove the circlip and washer from the pendulum shaft and pull out the rear belt backwards.

2 Rider Pro 15 and Pro 18



- Clean and loosen the hydraulic hoses on Rider Pro 18 in accordance with the Hydraulic System\Working Methods. Illustration, see 'Fitting'.
- Remove the cooling fan, which is held by a single nut.
- Disconnect the spring from the tensioning roller (1) and prise off the drive belt.
- Remove the spring clip, prise apart the speed control ball joint (2) (underneath) and disconnect the wire from the underside of the shaft.
- Disconnect the lead from the neutral switch (5).
- Remove the spring and nuts from the brake wire (3) and unhook the wire from the brake arm.
- Remove the circlip and washer from the swing axle (4) and remove the rear frame.

3



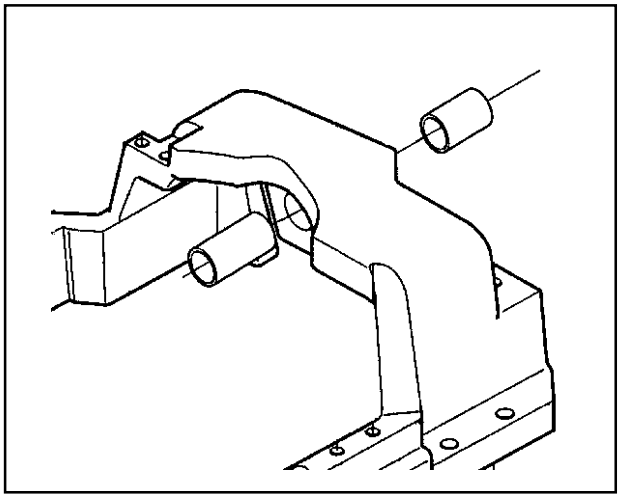
Remove the circlip and washer from the swing axle's inner holder (1) and pull the swing axle out backwards. Use a suitable drift or puller if needed.

If the dust protection (2) is damaged, this should be replaced by a new one.

Replacing bushings

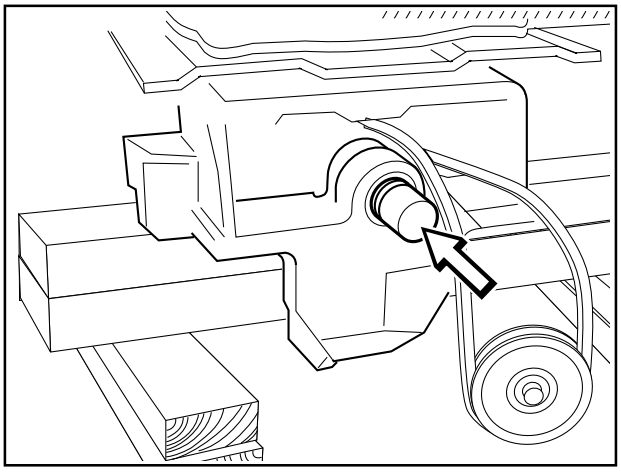
Once the swing axle has been removed the bushings fitted to the rear frame must be replaced. Remove these with a punch, see “Special Tools”.

New bushings are fitted with the punch see “Special Tools”. Make sure that the bushing grooves are lined up horizontally. It is important that the outer edge of the outermost bushing is flush with the outer edge of the hole. Lubricate the bushings with a lithium-based grease.



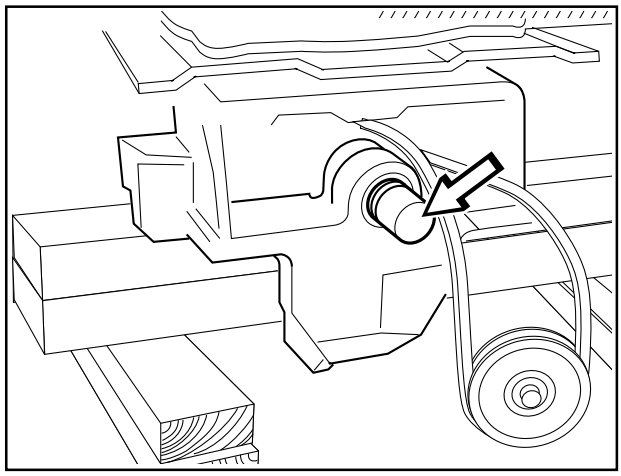
Installation of swing axle

1



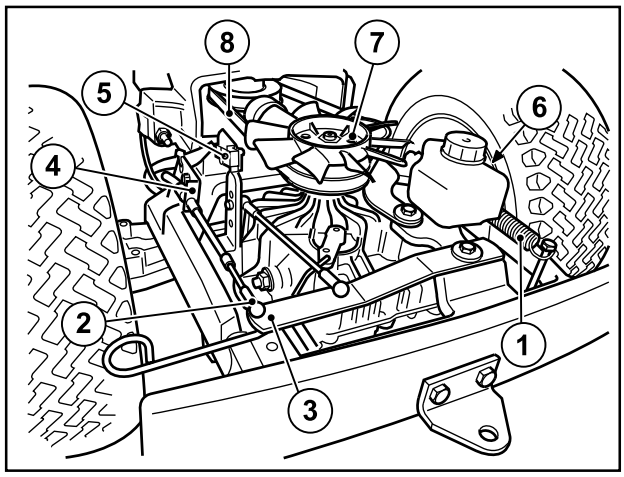
- Grease half of the axle (the half that has not been turned down) and press it from the back into the steering spindle (see diagram).
- Attach the washer and circlip on the swing axle's inner holder.
- Fix the dust guard (with a thin lip behind) approx. 2/3 of the way in on the axle and lubricate the axle on both sides of the dust guard.

2



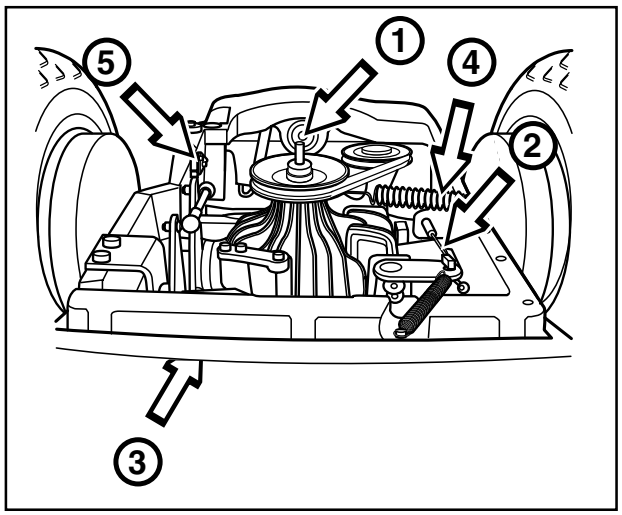
Roll the rear frame forwards and press it in on the swing axle.

3 Rider 15V2



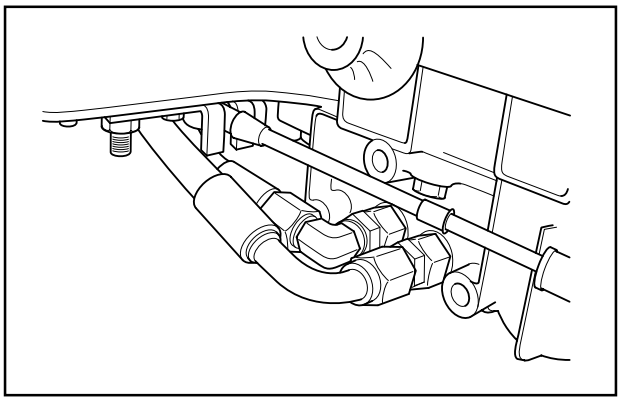
- Fit the washer and circlip on the pendulum shaft.
- Fit the hydrostatic transmission cable and its casing (2+4).
- Attach the cable to the neutral position contact (5).
- Fit the rear belt (8).
- Attach the brake cable to the arm under the tank and the casing fixture on the rear frame (6).
- Fit the idler’s spring (1).
- Fit the hydrostatic transmission’s fan and the circlip (7).

3 Rider Pro 15 and Pro 18



- Attach a washer and circlip onto the swing axle (1).
- Connect the brake wire (2) to the brake arm. Tighten the brake wire nuts.
- Fit the linkage for the throttle control (3). Fix the wire on the underside of the axle.
- Fit the drive belt over the pulley and attach the spring to the tensioning roller (4).

Only Rider Pro 18



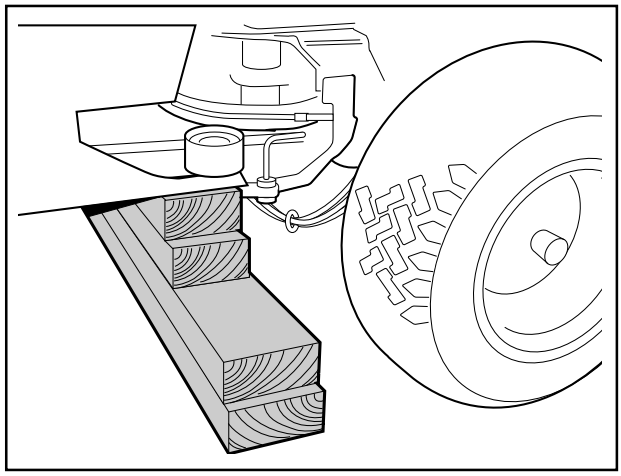
Connect the hydraulic hoses to the hydrostatic transmission.

4

- Also check that the controls and cables are properly adjusted, (see 'Checking and Adjusting the Brake Cable' and 'Checking and Adjusting the Accelerator Cable').
- Check and adjust the neutral position switch if necessary.
- Fit the fan.
- Finally, fit the transmission cover.

Removing/installation of hydrostatic transmission

1



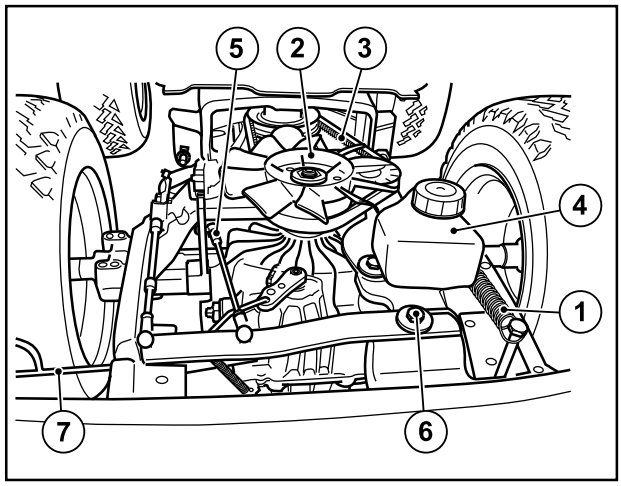
- Block-up the machine in front of the rear frame and remove the back wheels.
- Remove the transmission cover.

Only Rider Pro 18

Illustration, see 'Fitting Pendulum Shaft'.

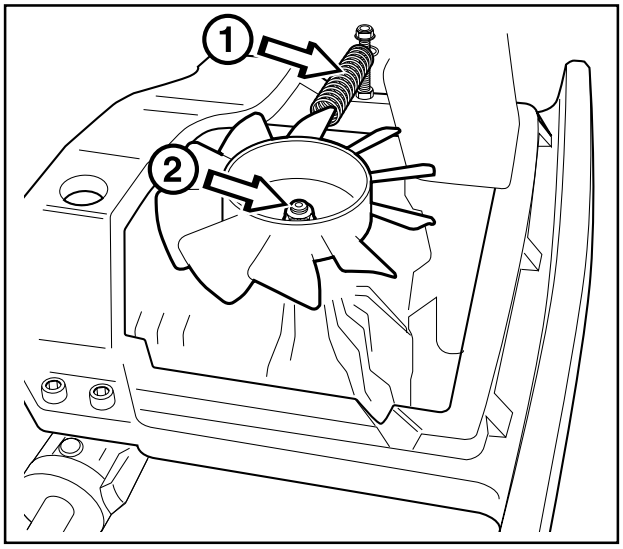
- Clean, see 'Hydraulic system\Working methods'.
- Loosen the hydraulic hoses from the hydrostatic transmission.

2 Rider Pro 15V2



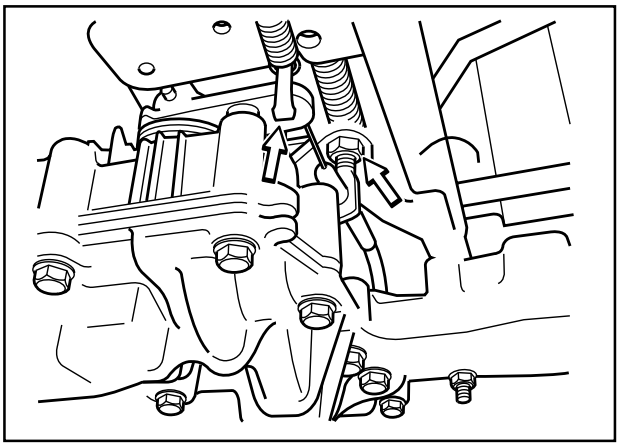
- Loosen the idler's spring (1).
- Remove the fan (2); it is held in place by a circlip.
- Wiggle the drive belt off (3).
- Remove the oil tank (4).
- Loosen the hydrostatic transmission link (5) in the forward ball joint.
- Remove the screw (6) that holds the arm.
- Remove the clutch control (7) and its spring.

2 Rider Pro 15 and Pro 18



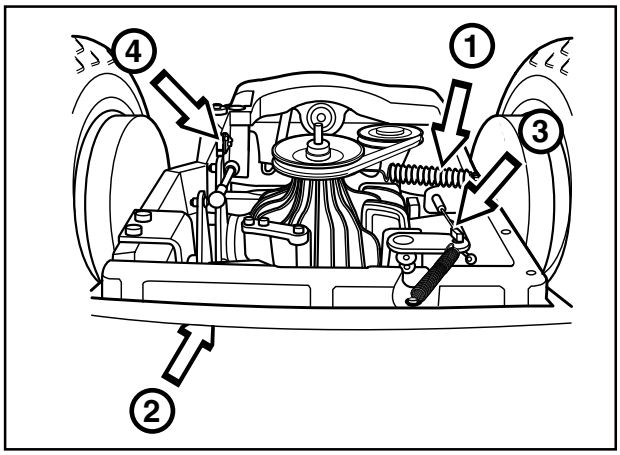
- Remove the nut (2), and lift off the washer and fan from the input axle.
- Remove the oil tank and hose from the hydrostatic transmission.
- Remove the disengaging control with its spring.

3 Rider 15V2



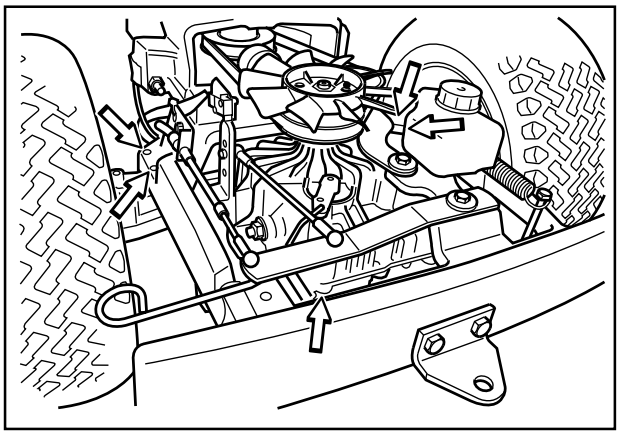
- Loosen the brake cable spring and remove the brake cable from the brake lever (hidden under the oil tank).

3 Rider Pro 15 and Pro 18



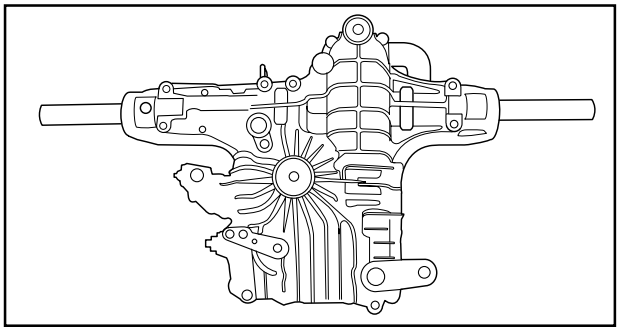
- Disconnect the tensioning roller spring (1) and prise off the drive belt.
- Release the speed control linkage (2) (on the underside) and release the wire from underside of the axle.
- Release the speed control linkage (on the topside) from the hydrostatic transmission arm.
- Release the brake wire (3) spring and nuts. Prise the wire off the brake arm.

4



Insert a garage jack under the hydrostatic transmission and loosen its five holder screws.
The rear retaining screw is placed in the front edge of the bumper.

5



- Lower the garage jack and pull out the hydrostatic transmission.
- Installation of the hydrostatic transmission is carried out in the reverse hydrostatic transmission removing order
- After replacing, check that the brake wire and speed control are correctly adjusted (see Checking and adjusting of brake wire" and "Checking and adjusting of speed control"). Check also the oil level in the tank, and bleed or top up if necessary.
- Check and adjust the neutral position switch if necessary.
- Check the hydrostatic transmission's oil level after test running, and top up if necessary.

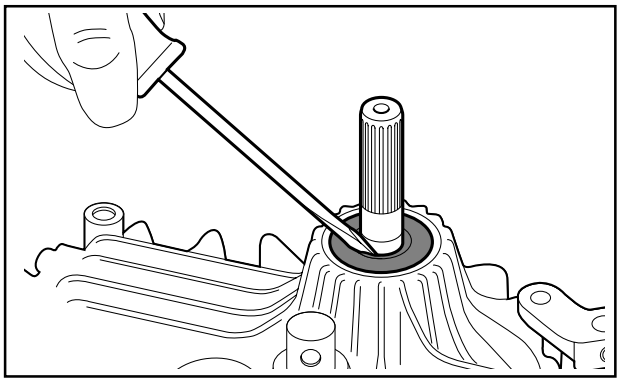
Replacing hydrostatic transmission axle sealing collars

Remove the cooling fan. This is held by a nut on the Pro 15 and Pro 18 and a circlip on the 15V2. Remove the cooling fan, which is held by a single nut. Remove the pulley from the input shaft by pulling it outwards. Then remove the circlip under the pulley.

IMPORTANT INFORMATION

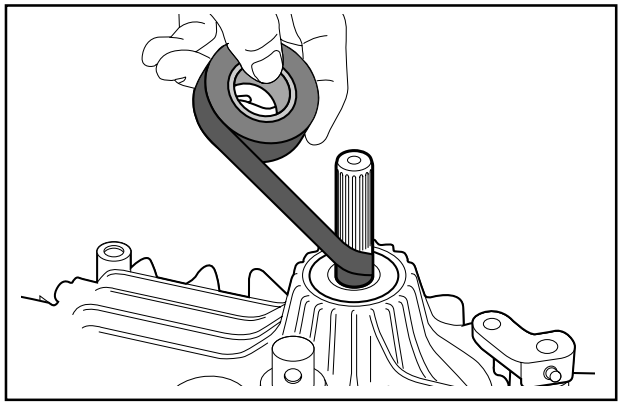
The area around the sealing collar must be absolutely clean! If the hydrostatic oil is contaminated with dirt, this can lead to a shorter hydrostatic transmission operational life.

1



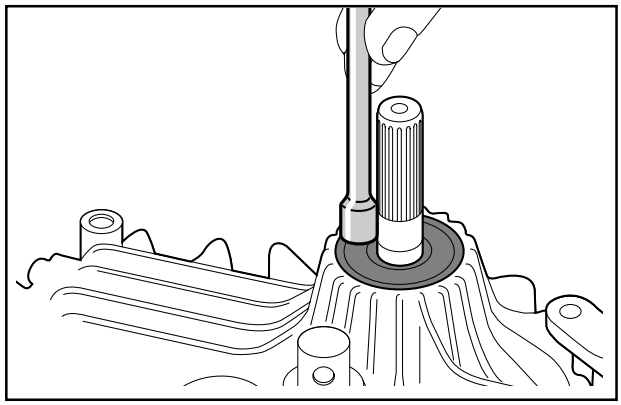
- Clean the input axle and the area around the sealing collar of all dirt and rust.
- Insert a screwdriver between the sealing collar and the axle and bend the sealing collar out of the axle housing with a twisting motion.

2



- Wrap insulation tape around the input axle to protect the new sealing collar from damage to splines and grooves.
  Start by wrapping from the bottom and continue upwards over the axle until the entire axle is wrapped in tape.
- Lubricate the axle and the inside of the new sealing collar with grease so that the collar can slide easily.

3



- Place the sealing collar on the axle with the smooth side upwards, and *carefully* press it downwards.
- Use the thick end of a 1/4" extender to *carefully* knock down the sealing collar until the upside of the collar is level with the axle housing's upper edge.
  Move the extender in a circle around the sealing collar so that it is evenly pressed down, all the way around.
- Remove the insulation tape from the axle and assemble the lower circlip and the pulley with the hexagonal hub facing upwards.
- Fasten the fan and the washer and assemble the upper circlip.

Sealing collar replacement - outgoing axles

1

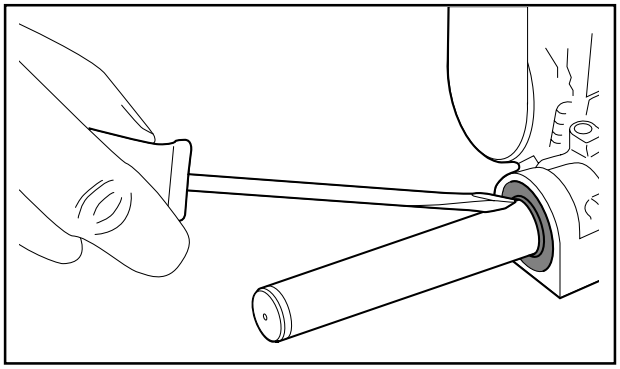
Remove the rear wheels.

Do not lose the key that sits between the hub and the axle.

Remove the spacing tube and washer from the wheel axle.

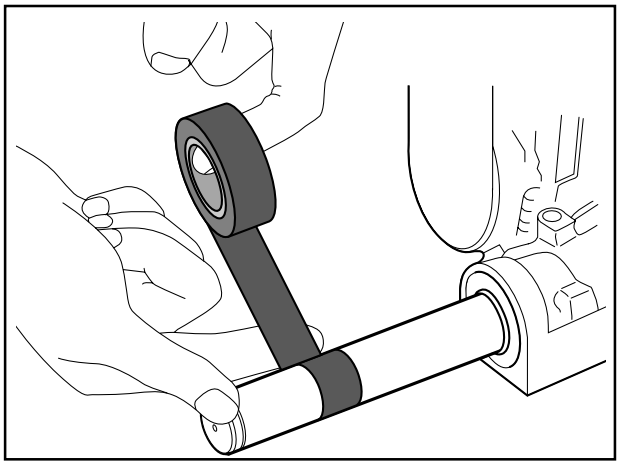
IMPORTANT INFORMATION

Dirt must not be allowed to get into the transmission as this can shorten its operational life.



- Clean the outgoing axle and the area around the sealing collar of all dirt and rust.
- Insert a screwdriver between the sealing collar and the axle and bend the sealing collar out of the axle housing with a twisting motion.

2

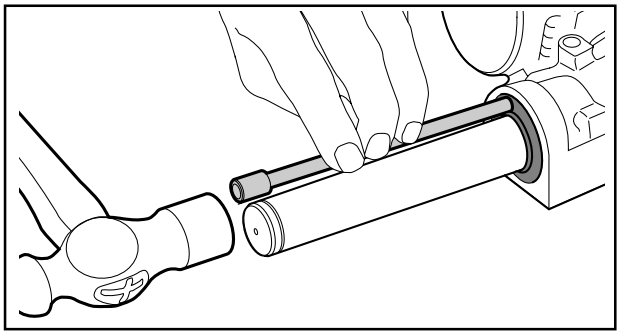


- Wrap insulation tape around the outgoing axle from the start of the key-way and outwards until even the circlip's groove is covered with tape. This is done to protect the new sealing collar from damage.
- Lubricate the axle and the inside of the new sealing collar with grease so that the collar can slide easily.

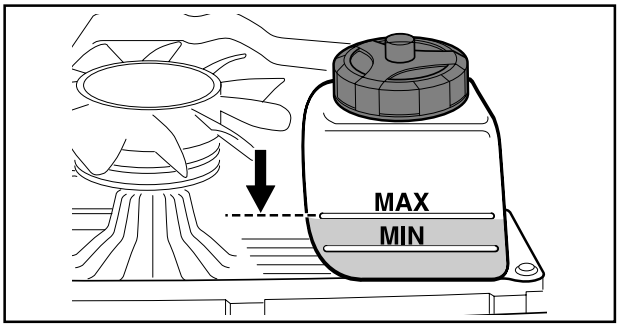
IMPORTANT INFORMATION

Before the sealing collar is completely installed, check that the sealing collar's metal spring reinforcement sits on the side of the sealing collar which leads inwards towards the transmission.

3



- Place the sealing collar on the axle, with the metal spring inwards, and press it in *carefully*.
- Use the narrow end of a 1/4" extender to *carefully* knock in the sealing collar until it reaches the bottom of the axle housing. Only knock on the steel cover.
  Move the extender in a circle around the sealing collar so that it is pressed in evenly all the way around and tight against the axle.
- Remove the insulation tape from the axle and repeat, as is necessary, the entire procedure for the second axle.
- Replace the washer, spacing tube, key, rear wheel, circlip and hubcap.

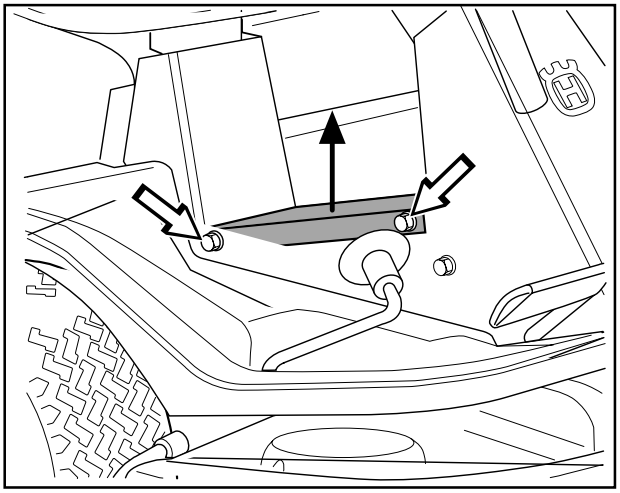


- Fill the transmission's oil container with SAE 10W30 oil until the oil level reaches the "MAX"-marking.
- Bleed the hydrostatic transmission as shown in “Bleeding the hydrostatic transmission’s oil system”.
- Operate the ride-on mower and then check that there is no oil leaking from the new axle sealing collars.
- Check the oil level and top up if necessary after test running.

Replacing hydrostatic transmission wire

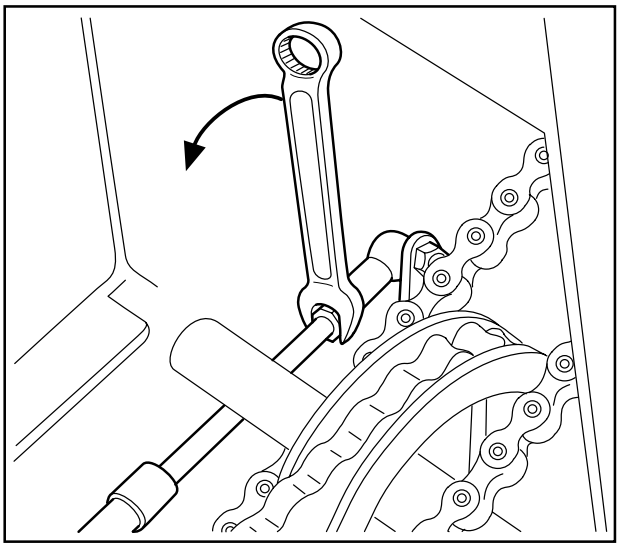
Removal of hydrostatic transmission wire

1

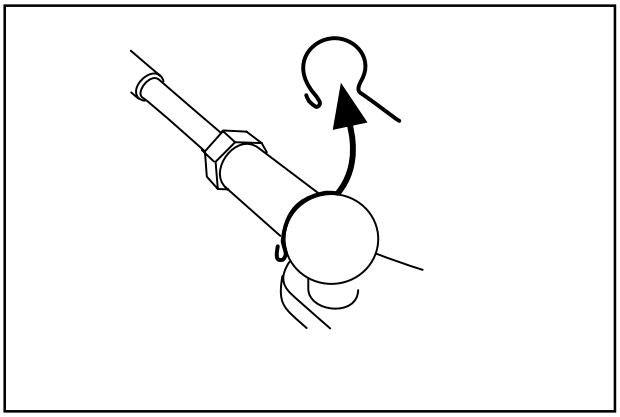


Remove the frame plate. The illustration shows Pro 15. For an illustration of the Pro 18 see ‘Fitting Hydrostatic Transmission Cable’.

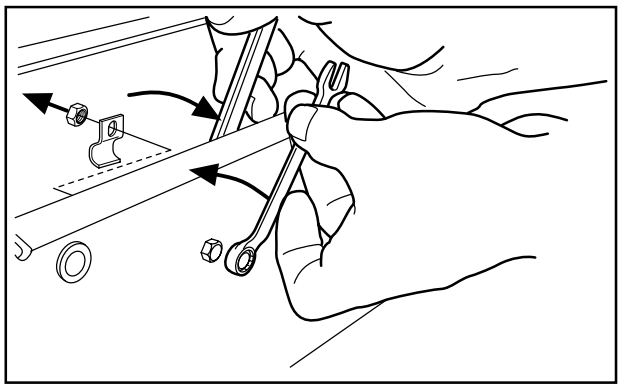
2



Loosen the hydrostatic transmission’s front lock nut a 1/4 turn and remove the lock spring.



3

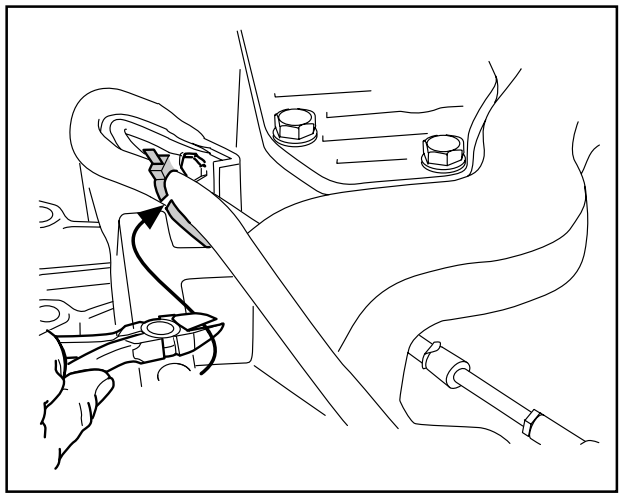


Remove the hydrostatic transmission wire’s front clamp fixed inside the middle bracket.

4

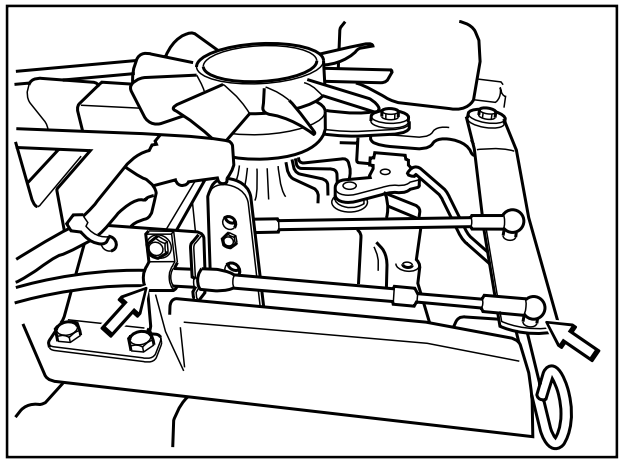
Remove the transmission cover.

5



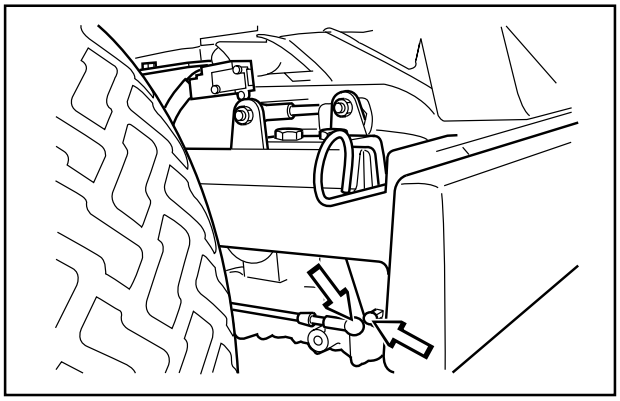
Follow the hydrostatic transmission wire backwards towards the transmission and cut off the cable ties round the wire.

6 Rider 15V2



Remove the locking spring by the hydrostatic transmission cable’s rear link joint. Loosen the bracket that holds the cable casing.

6 Rider Pro 15 and Pro 18

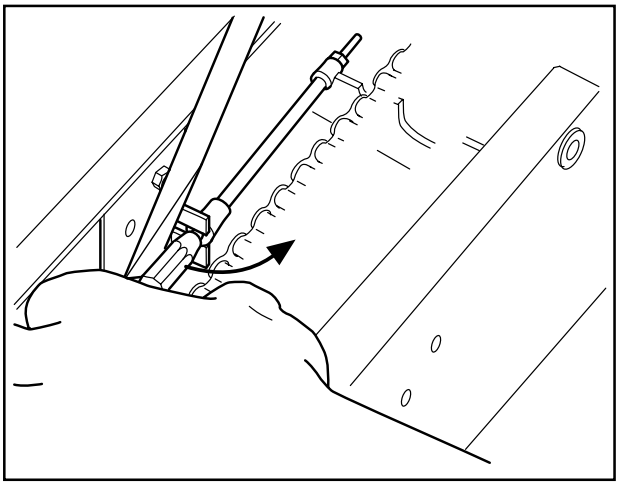


Remove the locking spring at the rear linkage on the hydrostatic transmission wire. Release the clamp under the left drive shaft.

7

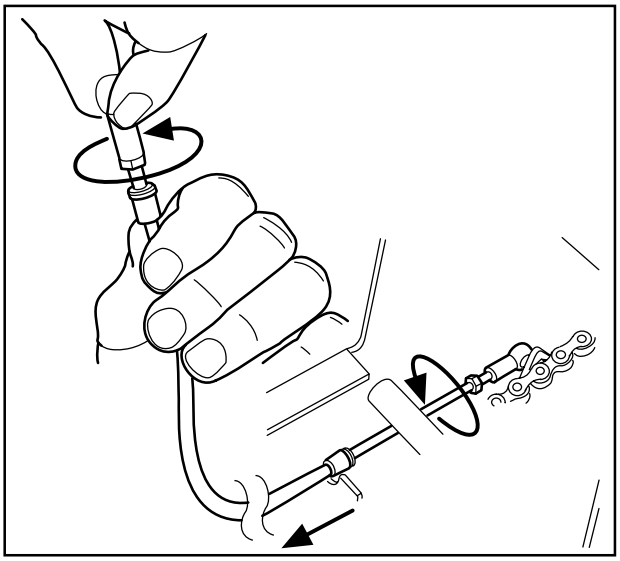
Lift off the linkage and pull out the wire.

8



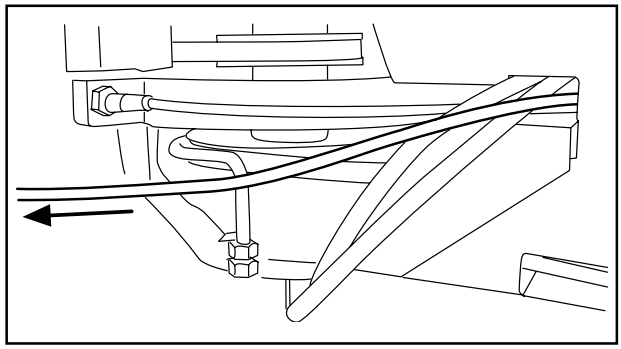
Lift out the transmission wire with the linkage attached.

9



Unscrew both ball joints from the hydrostatic transmission wire.

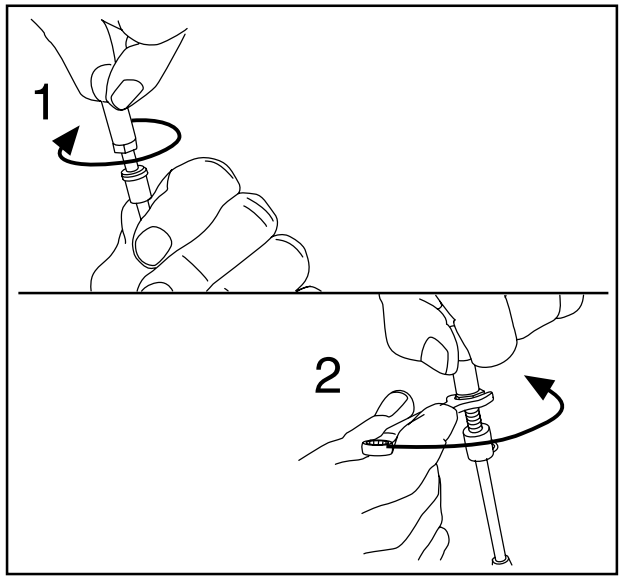
10



Remove the entire hydrostatic transmission wire.

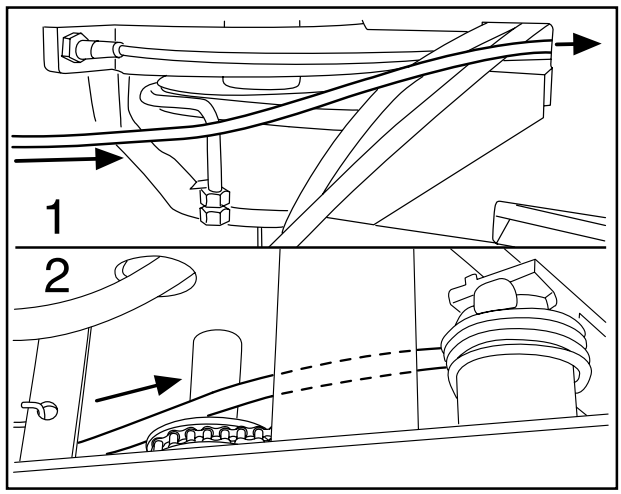
Refitting hydrostatic transmission wire

1



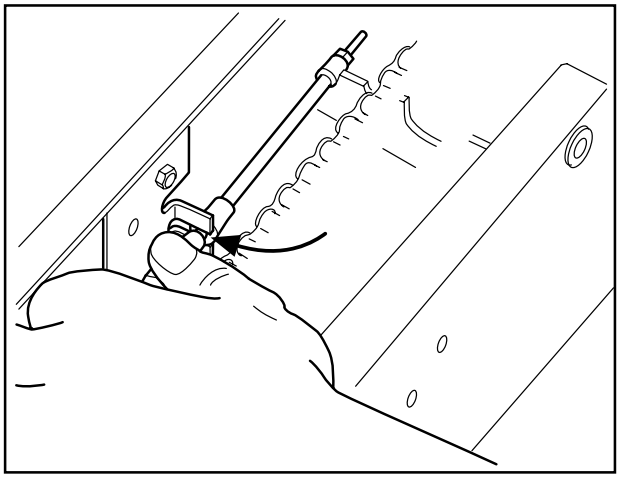
Screw the front ball joint onto the new transmission wire and tighten the lock nut.

2



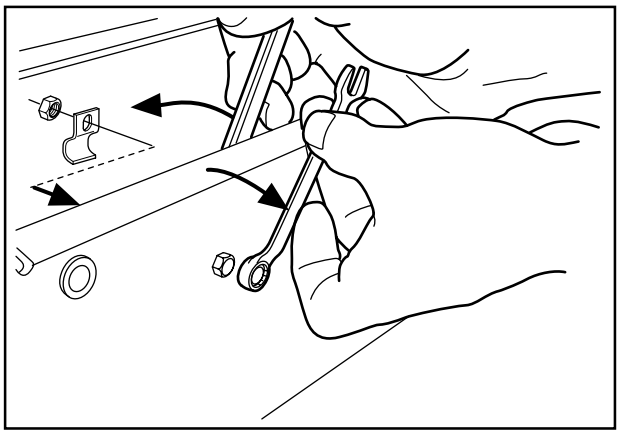
Run the wire through the mower so that it follows the same route as the old wire.

3



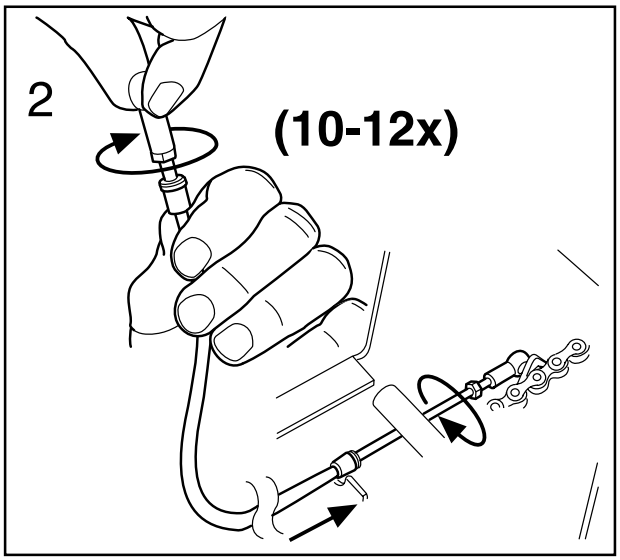
Press the wire casing in the front holder in the middle bracket.

4



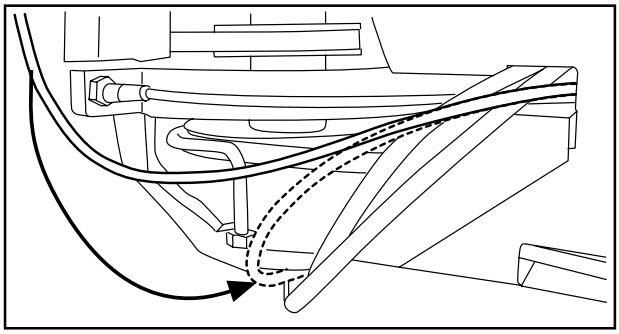
Screw tight the hydrostatic transmission wire's clamp. Press the linkage in its holder and fit the lock spring.

5



Screw tight the linkage on the rear part of the hydrostatic transmission wire. Screw 10-12 turns so that the linkage is the right length.

6

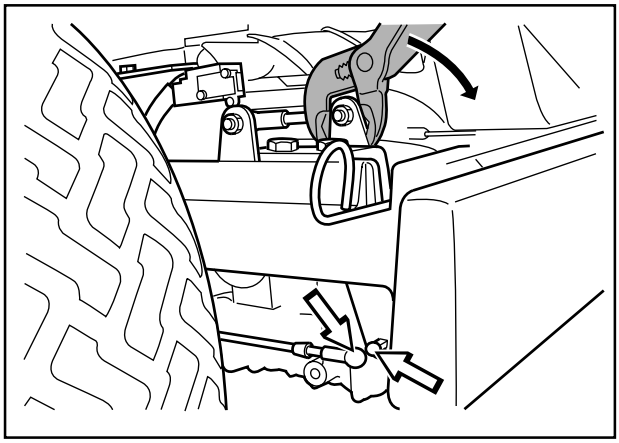


Draw the transmission wire along with the other cabling. Place the wire at the bottom in the clamp, under the articulated steering's bearing.

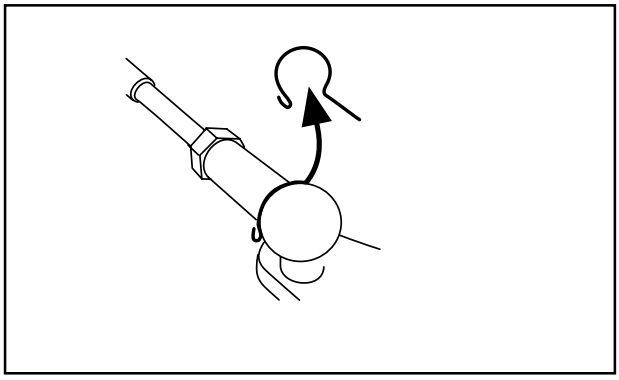
7

Place the hydrostatic transmission cable in place and screw it on with the rear bracket.

8



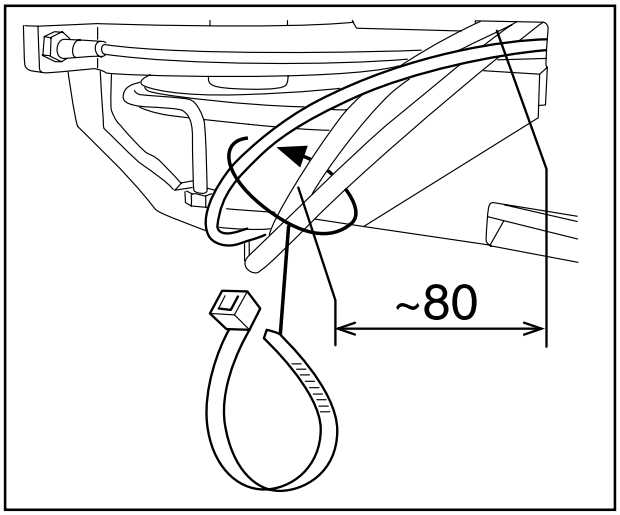
Adjust the wire as directed in "Inspection and adjustment of speed regulator". Connect the rear linkage and fit the lock spring. Tighten the rear lock nut for the linkage.



9

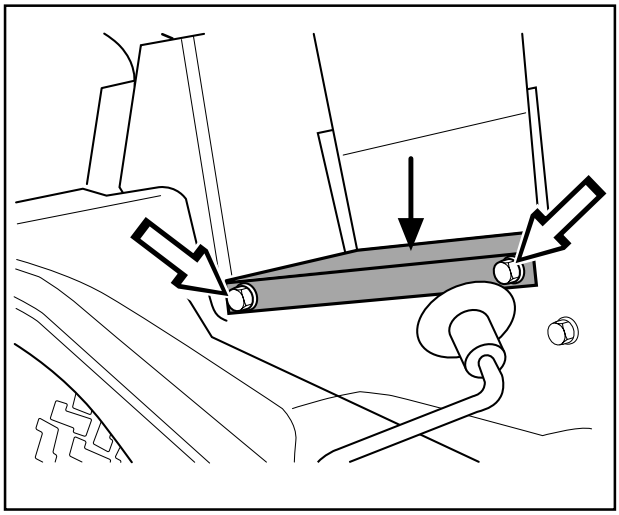
Check the setting of the neutral position contact.

10

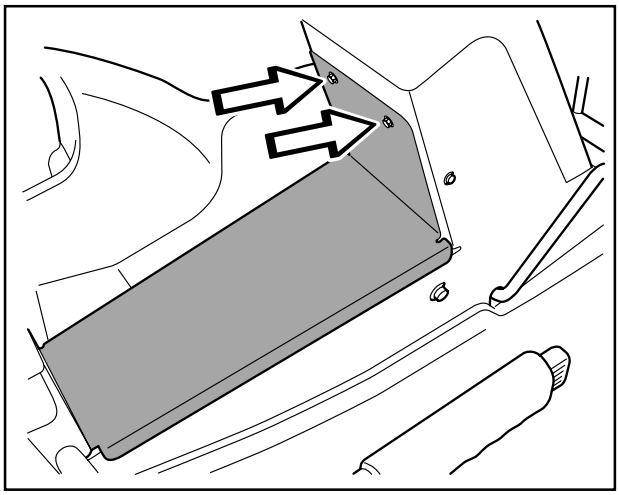


Fix the hydrostatic transmission wire with a cable ties.

11



Tighten the frame plate, four screws on the Rider 15V2, Pro 15 and two screws on the Pro 18.



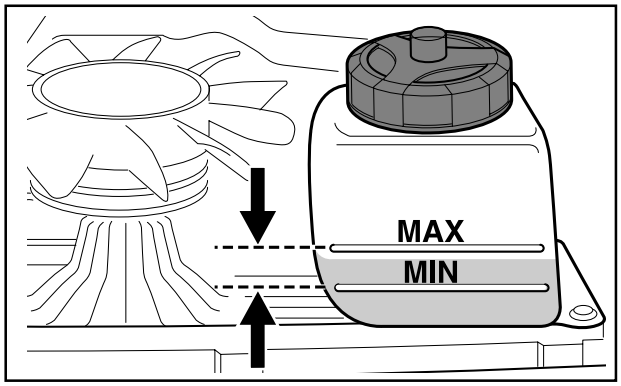
Bleeding the Hydrostatic and Hydraulic Systems

1

IMPORTANT INFORMATION

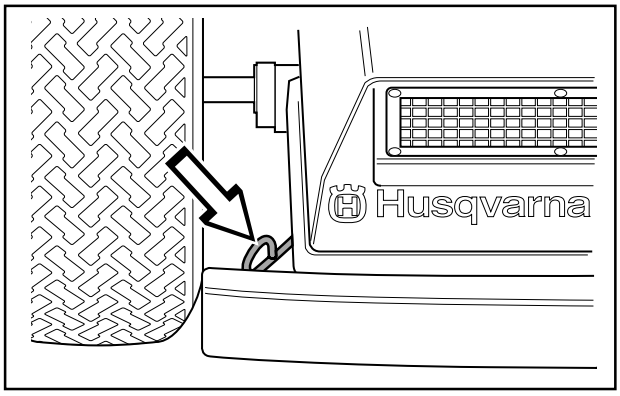
The tank must never be run empty while work is underway. Risk of air penetration into the system.

Used oil may not be reused.



- Check the hydrostatic transmission oil level.
- Start the engine and set the throttle control to idle.

2



- Repeat opening and closing the disengaged clutch control whilst the front respective rear pedals are alternately pressed down.
- When the mower starts to move set the governor control lever to high idle.

3

- Repeat quick starts and emergency stops until the transmission responds as it should.
- Pro 18: Turn the steering wheel repeatedly from one extreme position to the other until the steering works without jerks or stops.
- Check also the oil level in the hydrostatic transmission, and top up if necessary.

4

- Test run the machine.
- Finally, check the hydrostatic transmission's oil level, and if necessary top up in the oil tank.

Adjustment of transmission neutral position

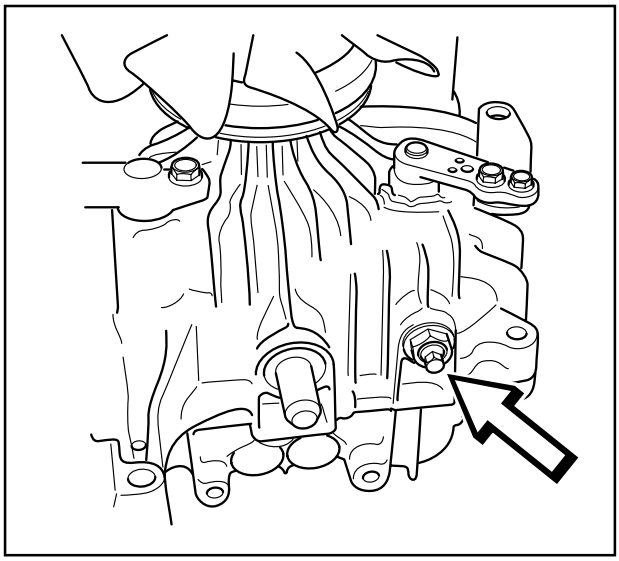
1

Bleed the hydrostatic transmission oil system.

2

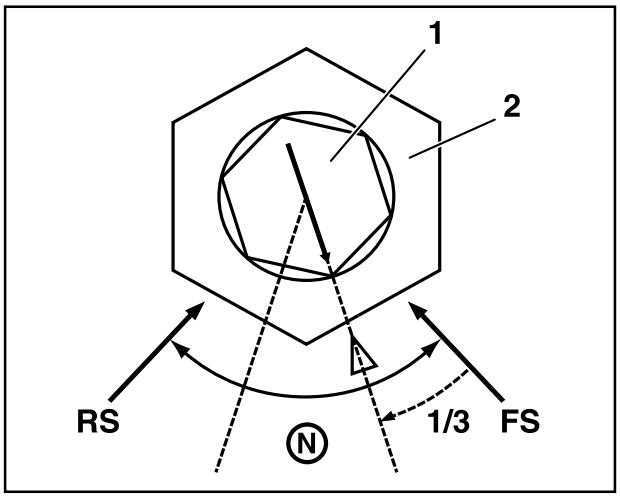
Lift the back of the ride-on mower up so that the wheels are off the ground and place blocks under the machine.

3



- The neutral position is adjusted by turning the hexagonal axle on the transmission (see diagram).
- Start the engine and set the throttle control to full throttle.
- Unscrew the hexagonal axle lock nut and turn the axle clockwise until the drive shafts start to rotate backwards.
- Make a mark on the top of the axle.

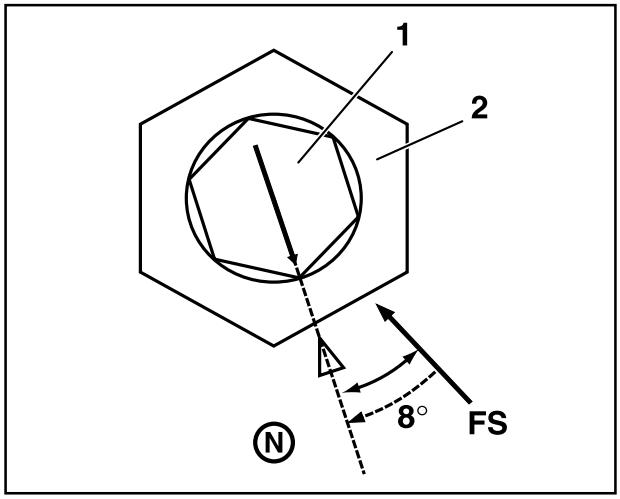
4



1 = Axle
2 = Lock nut

- Slowly turn the axle anti-clockwise until the drive shafts stop rotating backwards and make a mark on the transmission housing (RS).
- Slowly turn the axle anti-clockwise until the drive shafts start to rotate forwards.
- Slowly turn the axle clockwise until the drive shafts stop rotating forwards and make a mark on the transmission housing (FS).
- Turn the axle clockwise 1/3 of the distance between the marked stop points.
- Hold the axle (N=8) firmly and tighten the lock nut (N=17).
- Check that the drive shafts do not rotate in the neutral position by slowly transferring the steering arm to the neutral position from the forwards and reverse positions.

5



1 = Axle
2 = Lock nut

If the drive shafts do not rotate backwards despite the hexagonal axle having rotated a full turn, the neutral position is to be adjusted in the following way:

- Slowly turn the axle anti-clockwise until the drive shafts start to rotate forwards.
- Slowly turn the axle clockwise until the drive shafts stop rotating forwards and make a mark on the transmission housing (FS) and the axle.
- Turn the axle clockwise 8° from the mark on the transmission housing.
- Hold the axle (N=8) firmly and tighten the lock nut (N=17).

Transmission maintenance

Oil change
Most garden owners do not have tools for or experience of changing transmission oil. The transmission probably has a longer operational life than other ride-on mower components, this makes transmission oil changes less important for most customers. However, the transmission's operational life is increased if oil changes are made.

If the Rider is used professionally it is recommended that the engine oil is replaced after the first 50 hours in service and then every 500 hours or at least once a year.

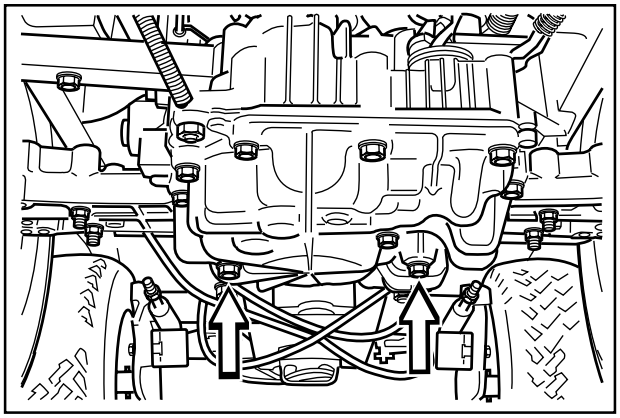
IMPORTANT INFORMATION

Spent engine oil is hazardous to health and must not be poured out on the ground or in the nature, but should be handed in to a designated place for recycling.

Avoid skin contact and wash any spillage with soap and water.

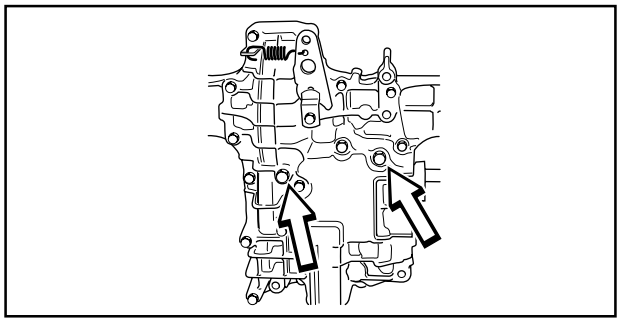
K46 Rider 15V2

The transmission holds 2.5 litres / 2.35 US qt (SAE 10W/30, engine oil, class SF-CC).



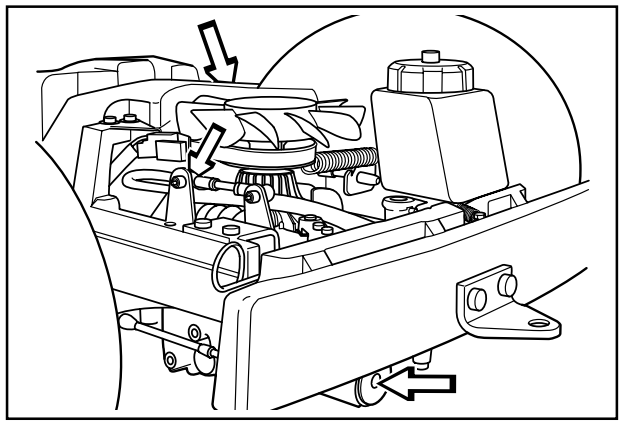
Empty the hydrostatic transmission by means of the two 14 mm plugs, the other screws are smaller in size.

K62 Rider Pro 15
Transmission holds 2,5 litres/2,64 USqt (SAE10W/30 engine oil, class SF-CC).

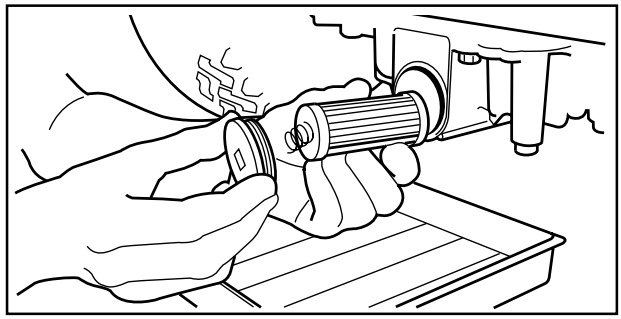


- Empty the hydrostatic transmission with the two plugs, width across flats 14 mm. The other screws have smaller widths.
- Disconnect the hose that runs to the transmission oil tank.
- Release the hexagonal socket head plug for the filler hole at the front on the top of the transmission.

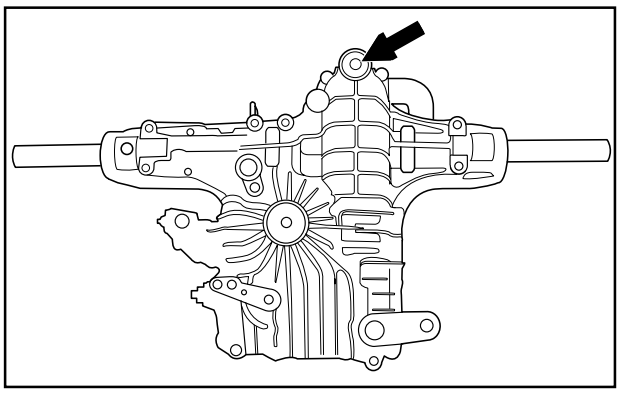
K66 Rider Pro 18
Transmission holds 2,5 litres/2,64 USqt (SAE10W/30 engine oil, class SF-CC).



- Remove the plug from the drain hole.
- Disconnect the hose that runs to the transmission oil tank.
- Release the hexagonal socket head plug for the filler hole at the front on the top of the transmission.



K66, drain hole. The filter must be replaced when the oil is changed.



K62 / K66, filler hole

Replace the drain plugs. Fill with oil through the filler hole. Replace the hose and fill the oil tank. Bleed the hydrostatic transmission as shown in “Bleeding the hydrostatic transmission’s oil system”. Test run the machine and top up with oil to the correct level in the oil tank.

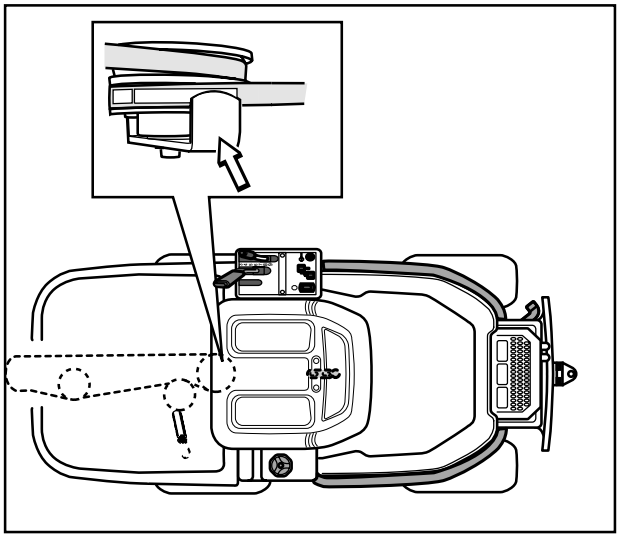
Removing belt

Rider 15V2, Pro 15 and Pro 18

Starting point when removing belt:

- There is no deck mounted on the Rider.
- The front part of the belt is hanging loose.

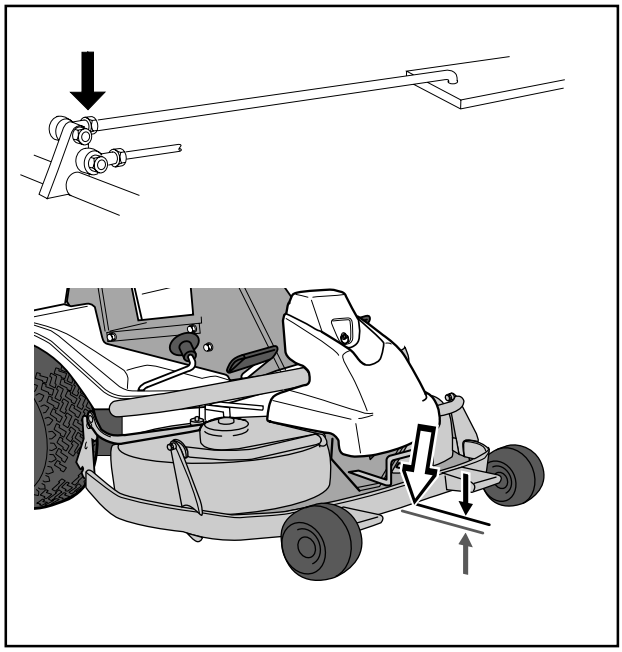
The complete belt is only removed as shown below when a snow blade is to be fitted on the Rider.



1. Release the belt guide and support belt pulley.
2. Release the wheel on the belt tensioner.
3. Take off the belt from the middle wheel and remove the belt.

To fit the belt, follow the dismantling instructions in the reverse order.

Adjusting cutting height



- Loosen the nuts on the height setting arm.
- Place the rider on a level surface and measure the distance between the ground and the edge of the cutting unit, at the front of the housing.
- Adjust the height adjustment strut so that the distance is:

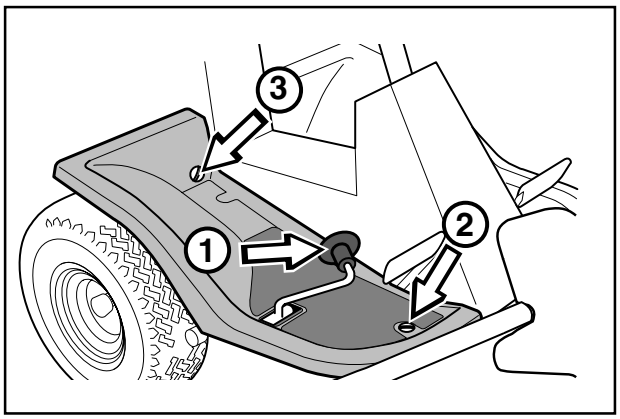
  - Bio 90, Bio 103, Combi 103 40 mm (1 7/16")
  - Other units 35 mm (1 3/8")
- Tighten the nuts.
- Check that the parallelism has not changed. If it has changed, the parallelism must be readjusted again.
- Check and adjust the cutting unit’s ground pressure as set out (see “Checking and adjusting cutting unit ground pressure”) if necessary.
- Fit the nose.

IMPORTANT INFORMATION

The parallelism and height must be adjusted again when changing the cutting unit.

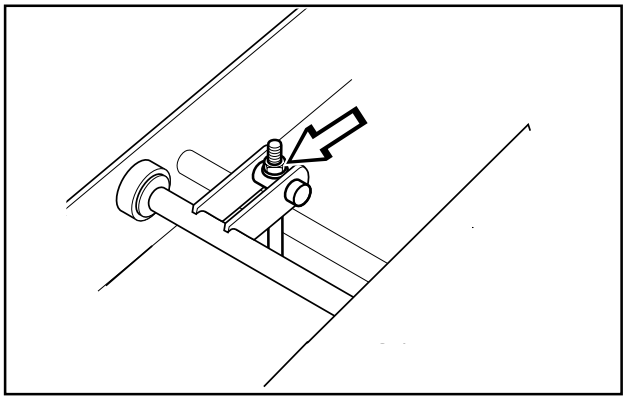
Adjusting cutting height area

1



Remove the right wing cover.

2

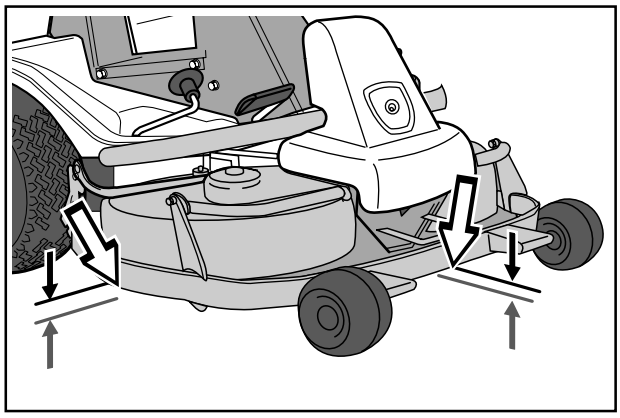


Raise or lower the entire mowing deck by screwing the nuts up or down.

If the highest cutting height is raised by 5 mm (3/16"), the other fixed cutting heights will also be raised by the same amount.

Checking and adjusting mower deck parallelism

1

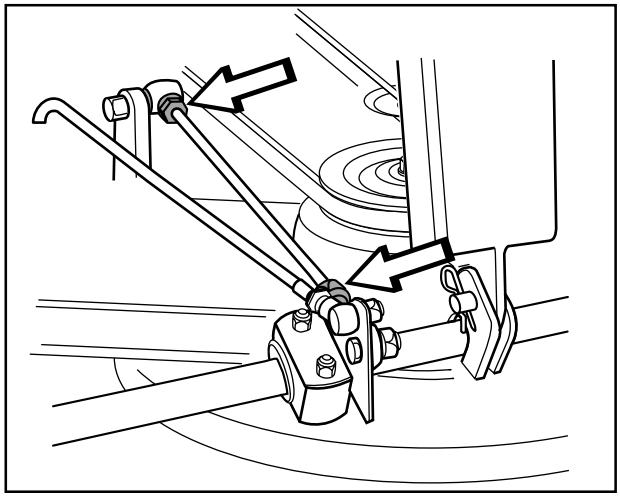


Check tyre pressures 60 kPa (8,5 PSI).

Place the ride-on mower on an even surface and measure the distance between the ground and the edge of the deck, at the front and rear of the cover.

The cutting unit should slope forwards slightly so that the rear edge is 2-4 mm (1/8") higher than the front edge.

2 Adjusting

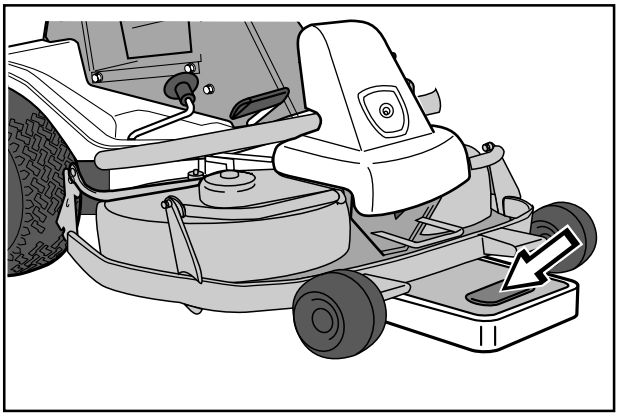


- Remove the front cover and the right-hand fender.
- Loosen the nuts on the parallel strut.
- Unscrew the strut (anticlockwise) to lower the rear edge of the hood.

  Screw the strut in (clockwise) to raise the rear edge of the hood.
- Tighten the nuts after adjustment.
- On completion of the adjustment the unit's parallelism should be re-checked.
- Fit the right-hand fender and the front hood.

Checking and adjusting mower deck ground pressure

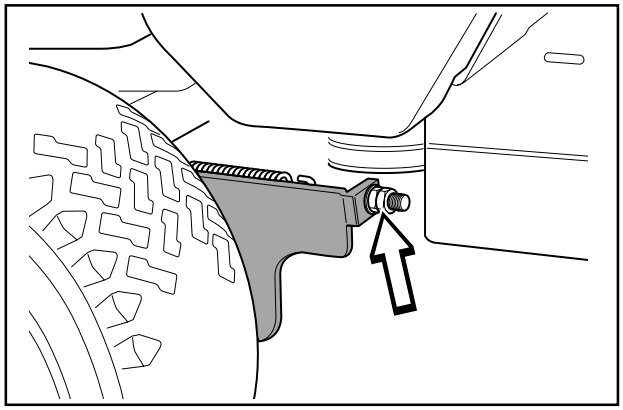
1



Check tyre pressures 60 kPa/8,5 PSI.

Place a set of bathroom scales under the mower deck's frame (front edge) so that the deck rests on the scales.

2



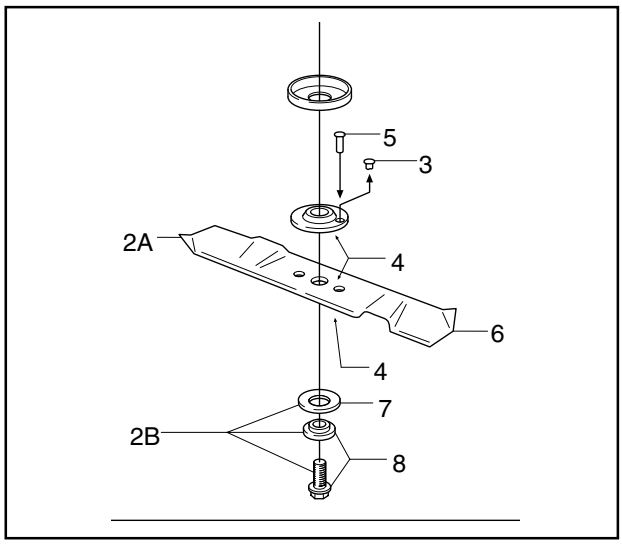
Adjust the mower deck's ground pressure with the adjusting nuts placed behind the front wheels on both sides of the machine. The ground pressure should be the same on both sides, between 12 and 15 kg/26,5-33 lb.

Replacing the break-pin (BioClip, Combi 103)

The blades are fitted with a break-pin to protect the BioClip unit and its drive when colliding with obstacles. A domed, spring friction washer is fitted to each blade bolt. The washer must always be replaced with a new washer when replacing the shear pin. Otherwise the break-pin can break causing the blades to collide.

Only use original spare parts. A set containing a blade, break-pin and friction washer can be purchased from your dealer.

1. Put the unit in the service position, see "Placing in the service position".
2. Remove the blade (2A) by removing the blade bolt with washer and friction washer (2B).
3. Remove the remains of the broken break-pin (3).
4. Make sure the contact surfaces (4) on the blade and the blade mounting are free from metal. Clean if necessary.
5. Fit **one** new break-pin (5) in the blade mounting.
6. Fit the blade (6), make sure it is fitted as illustrated.
7. Fit a **new** friction washer (7) with the concave face turned towards the blade.
8. Fit the blade bolt with washer (8). Tightening torque 45-50 Nm/32-36 lbft.

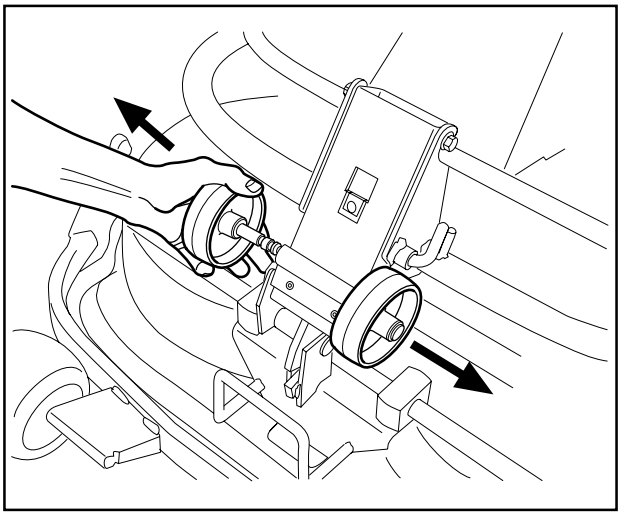


Removing the cutting unit

1

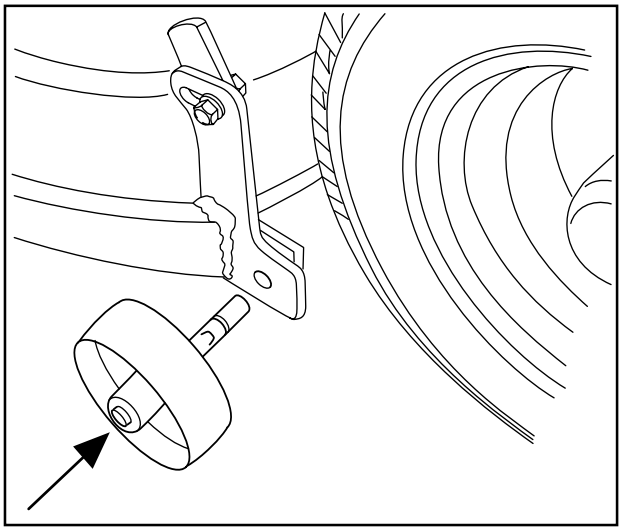
- Apply the parking brake.
- Adjust the cutting height to its lowest setting.
- Remove the front cover.

2



Release the two support wheels under the front cover.

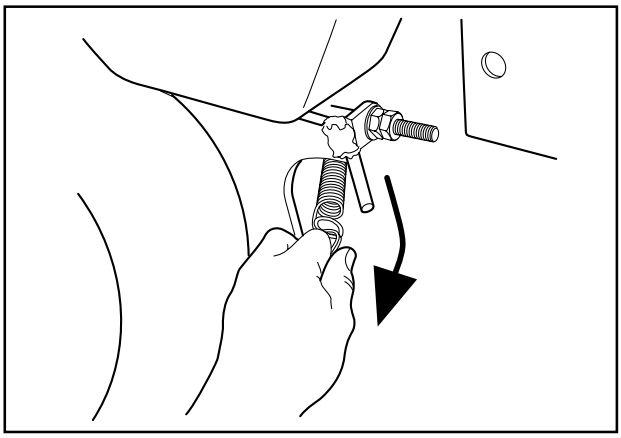
3



Fit the two support wheels on each side of the lower part of the deck.

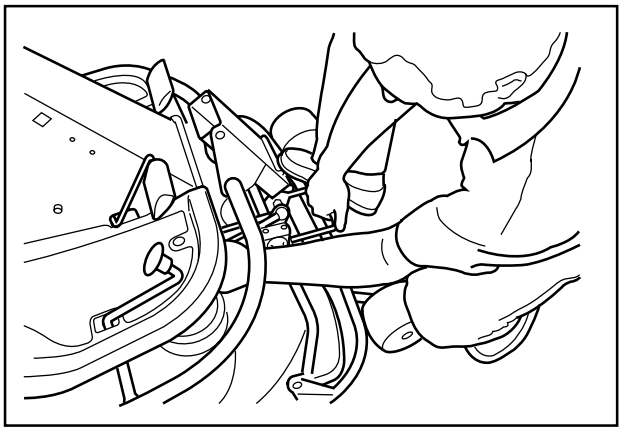
WARNING!
Wear protective glasses when removing the cutting unit. The spring which tensions up the belt can go off and cause personal injury.

3

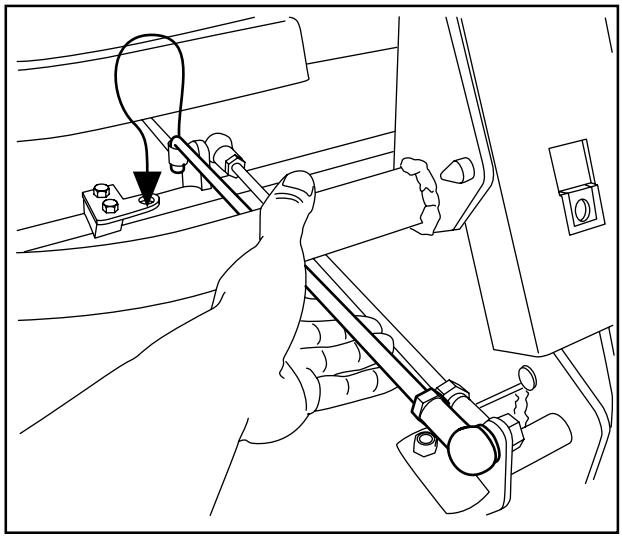


Release the spring for the drive belt's tensioning wheel. Move the cutting height lever to the lower position.

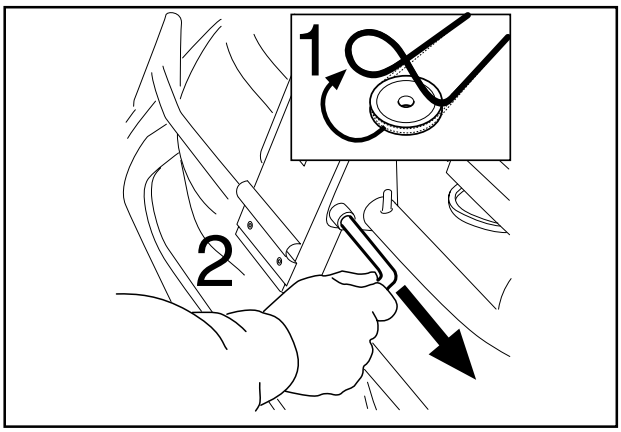
4



Place one foot on the front edge of the deck by the wheel, and lift the front edge of the deck to simplify releasing the height setting rod. Secure the rod in the holder.

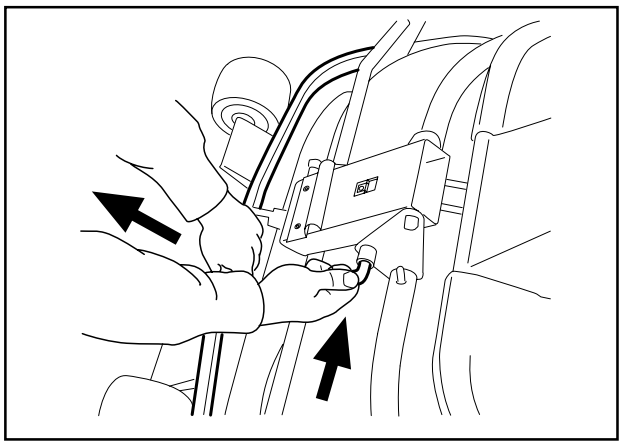


5



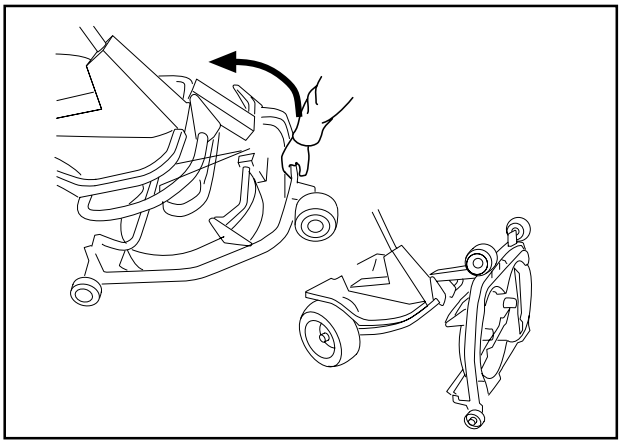
Lift off the drive belt (1). Now pull out the pin (2). Make sure not to trap your hand.

6



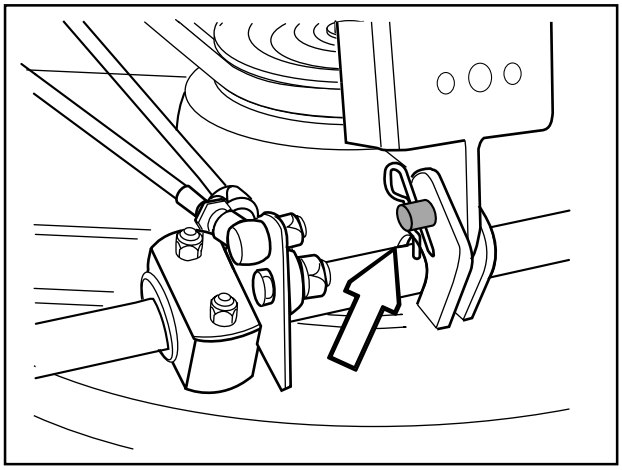
Pull the frame forwards and replace the pin.

7



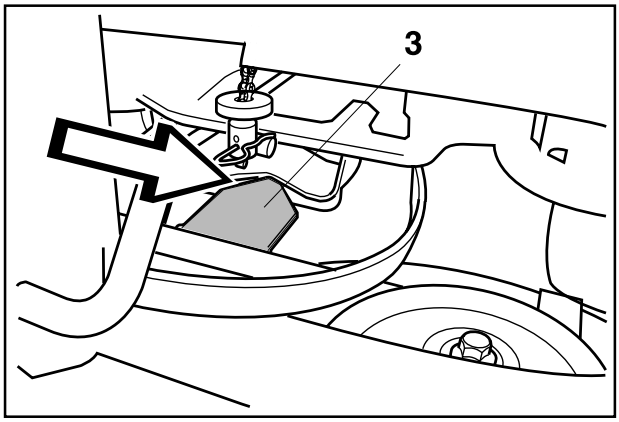
Grip the front edge of the deck, and pull out and lift it up to the service position.
Or:

If the cylindrical bolt, which is now holding the mowing deck is removed, the mowing deck can be lifted off.



To leave the service position

To leave the service position, reverse the procedures set out in “Placing in the service position”. Make sure that the cutting unit’s ‘lug’ (3) enters the loop correctly on the underside of the machine, see diagram.

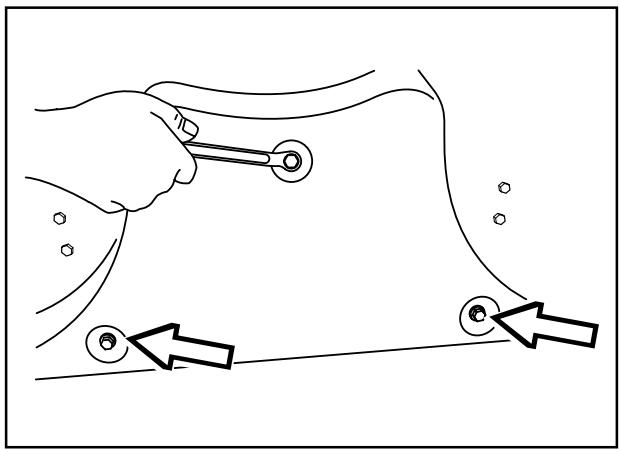


Removing the BioClip Plug (Combi)

To change a Combi unit from the BioClip function to a cutting unit with rear ejection, remove the BioClip plug, which is located under the unit, attached with three screws.

1. Put the unit in the service position, see ‘Placing in the Service Position’.
2. Remove the three screws holding the BioClip plug and remove the plug.
3. Tip: Fit three full-thread screws M8x15 mm in the screw holes to protect the threads.
4. Return the unit to the normal position.

Fit the BioClip plug in the reverse order.



Removal the BioClip Plug

Replacing the Cutting Unit’s Belts

Belt replacement on BioClip 90

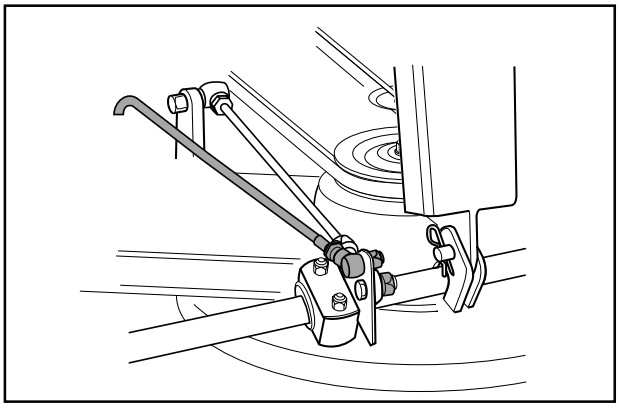
BioClip 90 is powered by a toothed drive belt that synchronises the rotation of the blades. The belt is located under the cutting unit cover.

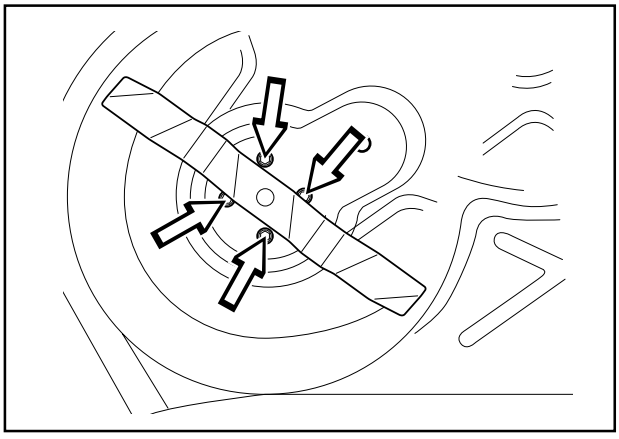
1. Dismantle the cutting unit.
2. Loosen the front bolt on the parallel strut and swing back the strut. Swing the height adjustment strut forwards.
3. Remove the screws holding the protective cover and lift off.

WARNING!
Protect your hands with gloves when working with the blades.

4. Tip: Mark the position of the blades on respective belts with a felt tipped pen.

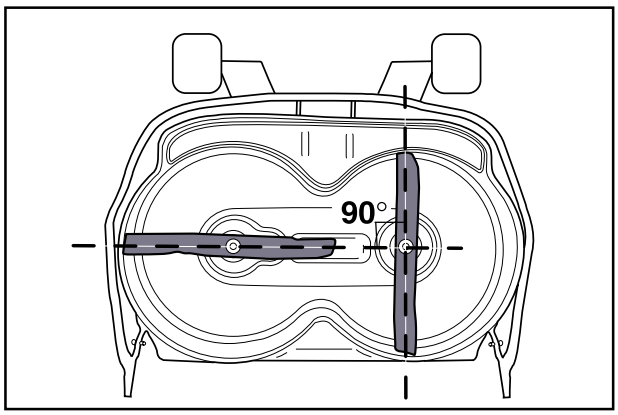
   Loosen the nut on the eccentric plate and twist this round. Loosen the four nuts (see picture) holding the blade bearing, so much that the bearing can be moved. Slide the blade bearing inwards and pull off the belt.





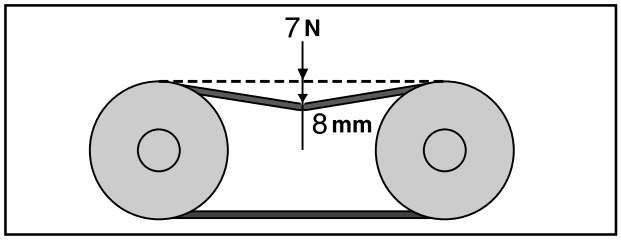
IMPORTANT INFORMATION

On a BioClip 90 unit the blades should be positioned at 90° to each other. Otherwise the blades can contact each other which may result in damage to the cutting unit.



5. Check that the blades are positioned at 90° to each other as illustrated, otherwise the belt must be adjusted. When the blade bearing is loose the belt can be guided over to the next tooth. Tighten the nuts so much that the bearings rest against the mowing hood, but can still be moved.

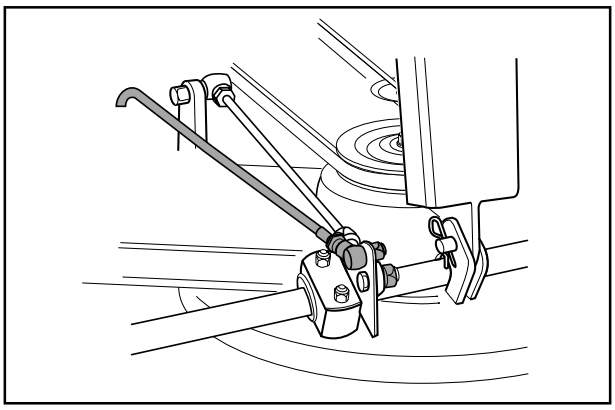
   Tension the belt by turning the eccentric adjuster on the top of the mowing hood. Tighten the nut. Tighten nuts on the blade bearings.



6. When the belt moves 8 mm (5/16”) inwards at a force of 7 N (1.5 lb) the belt tension is correct.
7. Fit the protective cover over the belt and secure the parallel strut.

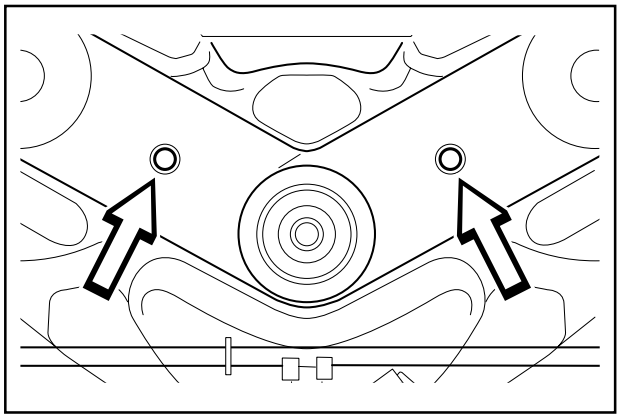
Belt replacement on Combi 103

1. Dismantle the cutting unit.
2. Loosen the front bolt on the parallel strut and swing back the strut. Swing the height adjustment strut forwards.



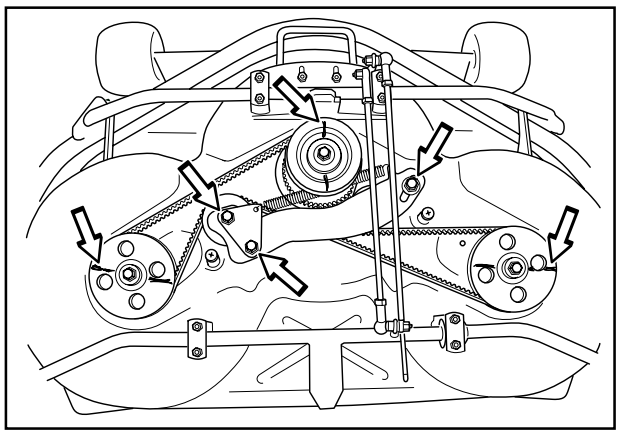
WARNING!
Protect your hands with gloves when working with the blades.

3. Loosen the two screws holding the protective cover and lift off.



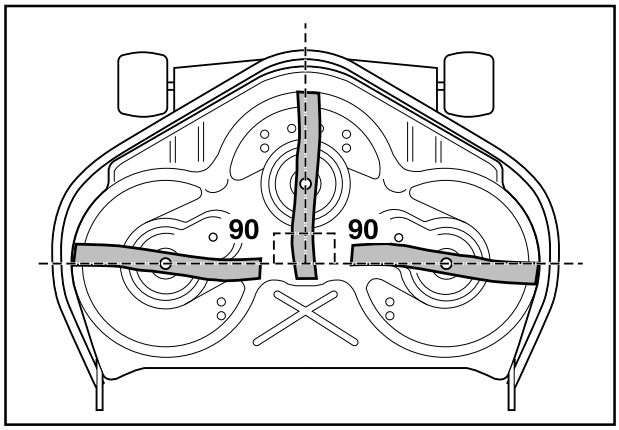
4. Tip: Mark the position of the blades on respective belts with a felt tipped pen.

   Loosen the three screws 1/2 - 1 turn. Squeeze the belts to their maximum slackness and tighten one of the screws. Change the belt and tighten as shown in the illustration (decal is on the cover). Set the blades at 90° angles and loosen the screw again. The spring provides the proper tension to the belt. Check the position of the blades again, adjust as needed by re-setting the belt. Tighten the three screws to 45 Nm / 32 lbf. ft.

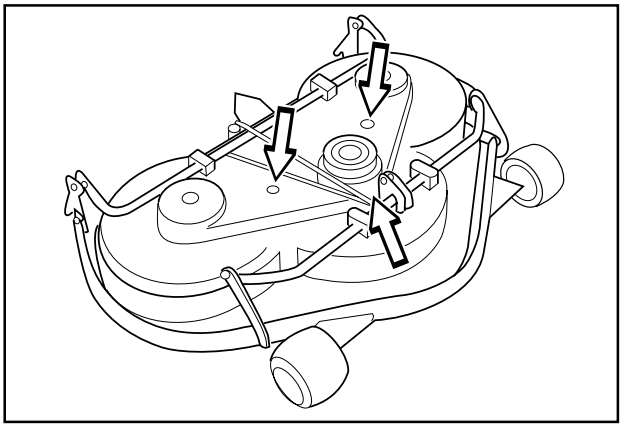


IMPORTANT INFORMATION

On a Combi 103 unit the blades should be positioned at 90° to each other. Otherwise the blades can contact each other which may cause damage to the cutting unit.



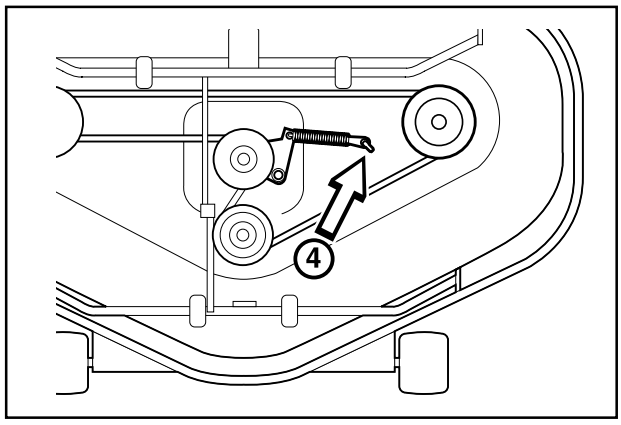
5. Fit the protective cover over the belts and secure the parallel strut.



Belt replacement on the cutting unit with side or rear ejection, Combi 112 and Combi 122

The blades on these cutting units with 'collision-proof' blades are driven by a V-belt. Do as follows to replace the V-belt:

1. Dismantle the cutting unit.
2. Loosen the bolt to the parallel strut and the two screws on the cover. Lift off the cutting unit cover.
3. Loosen the spring (4) that tensions the V-belt and pull the belt off. Attach a new belt in the reverse order.



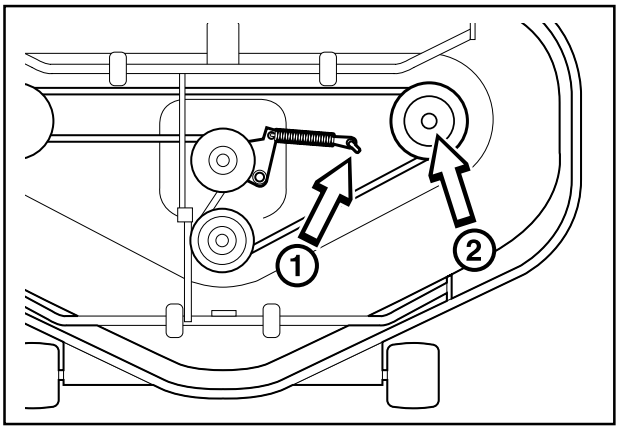
Removal of blades with bearings

Older versions

You can recognise these by the fact that the collar on the bearing housing is located on the top of the unit's cover.

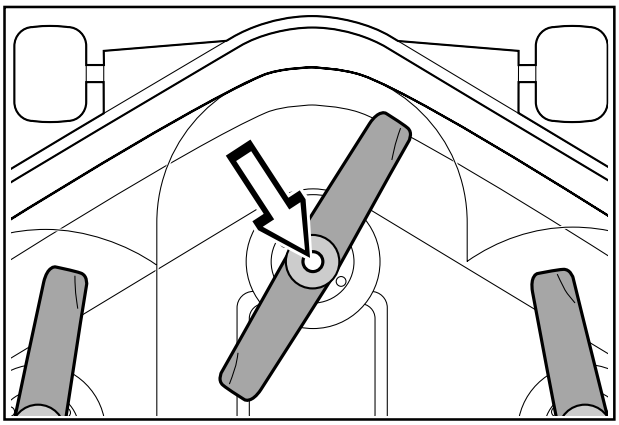
WARNING!
When working with the mowing deck, use protective glasses and gloves.

1



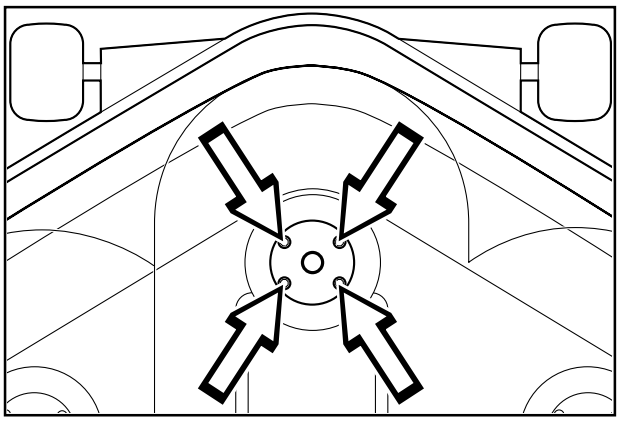
- Remove the cutting unit's upper cover, see 'Belt Replacement'.
- Release the spring which tensions the V-belt (1) and twist off the belt.
- Unscrew the screw which holds the pulley (2) and detach the pulley, a puller may be needed for this. Do not lose the key which is found between the pulley and the axle.

2



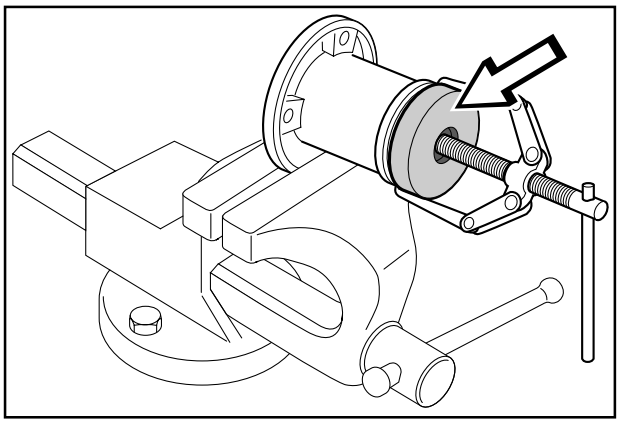
Unscrew the screw which holds the blade and remove the screw, washer and blade.

3



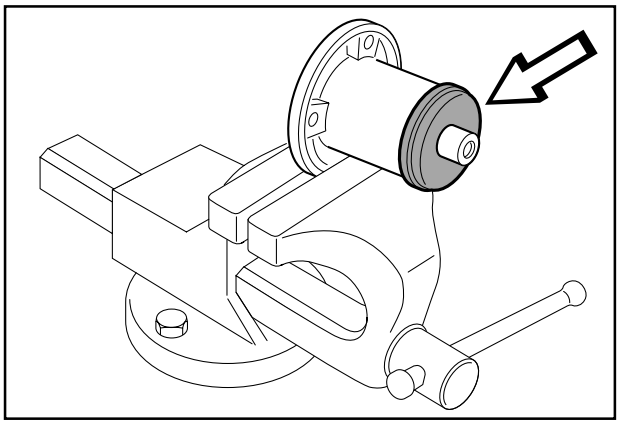
Unscrew the four screws which hold the blade bearing and remove the entire bearing packet from the mowing deck.

4



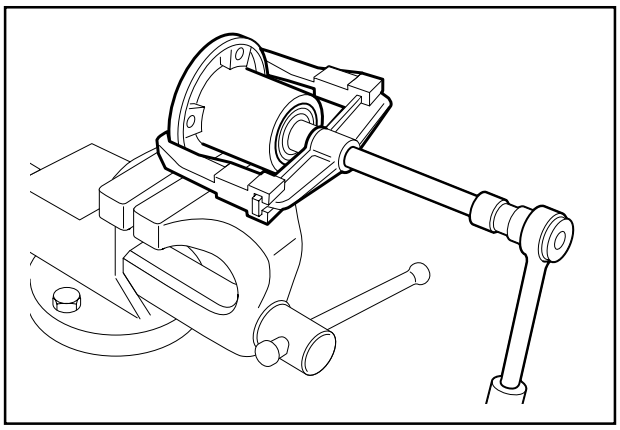
Remove the hub using a puller. Do not lose the key which is found between the pulley and the axle.

5



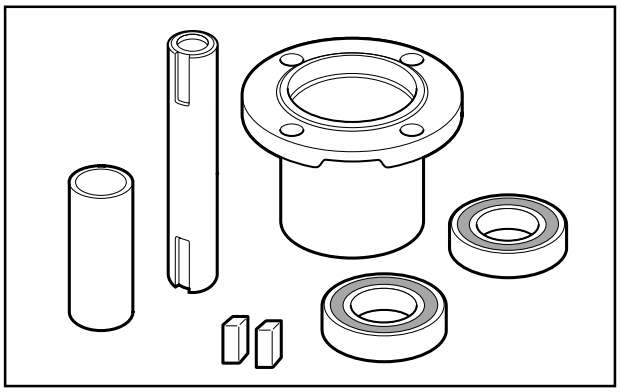
Remove the sheet metal safety washer.

6



- Mark one end of the shaft. Press out the axle with a puller.
- Knock out the bearings and remove the spacer.

7



The entire packet can be bought as a complete set with axle housing, axle, spacer and bearing.

Installation is carried out in the reverse removing order.

IMPORTANT INFORMATION

When tightening the screws for the blade shafts the screws on the transmission side should always be tightened first, followed by the blade screws.

The friction washer on a BioClip or Combi 103 unit must be replaced when replacing the shear pin.

Ensure that the axle is fixed in the same direction as it was removed, if not the keys will not fit into the key-way.

Tighten the blade bearings to a torque of 20–25 Nm/ 14-18 lbft.

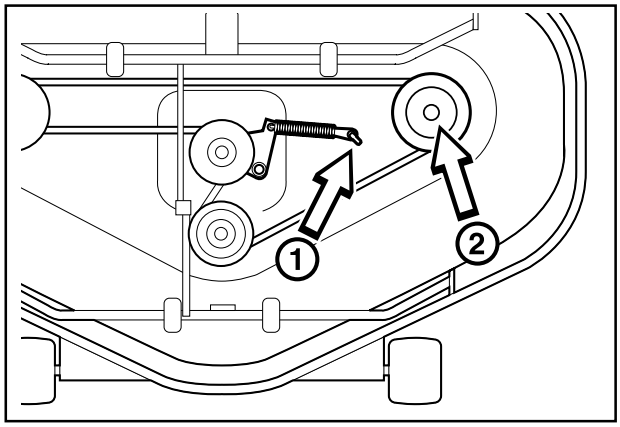
Removal of blades with bearings

New version (Combi 122)

You can recognise this by the fact that the collar on the bearing housing is located on the underside of the unit's cover.

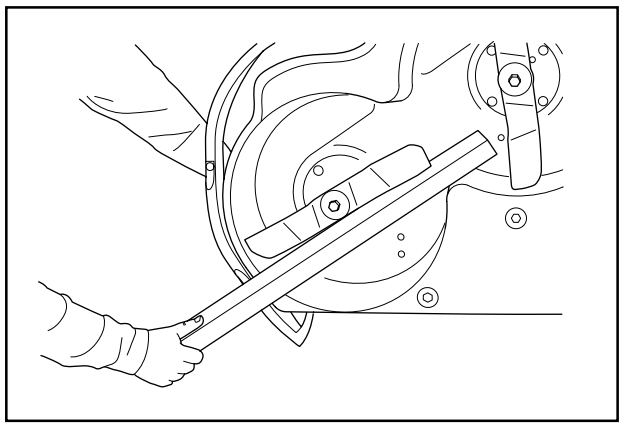
WARNING!
When working with the mowing deck, use protective glasses and gloves.

1



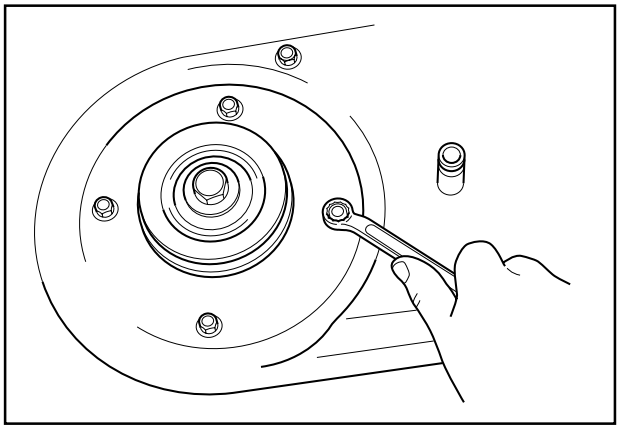
- Remove the cutting unit's upper cover, see 'Belt Replacement'.
- Loosen the spring (1) that tensions the V-belt and pull the belt off.

2



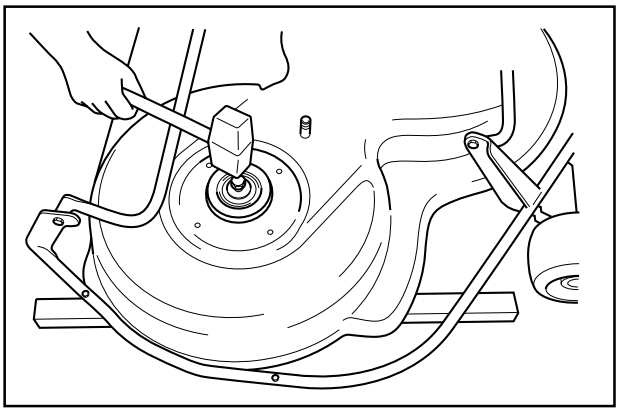
- Loosen the screw that holds the belt pulley (2) a few turns. Lock the blade with a wooden block or hold the belt pulley in place, with an oil filter wrench, for example.

3



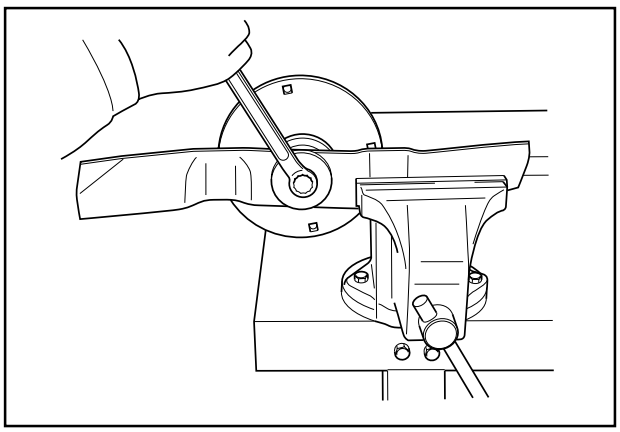
- Remove the nuts, which hold the bearing housing in position, from the top of the cover. Make sure that the unit is positioned with the belt pulley against the unit's cover.

4



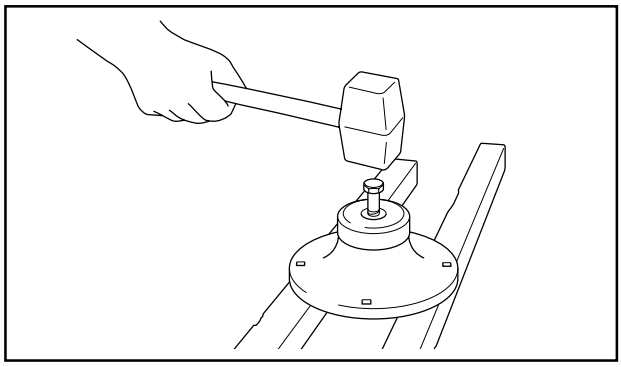
- Place a wooden block under the unit cover so that the blade is free from the supporting surface. Knock on the screw to remove the belt pulley. Do not knock hard enough to deform the cover. If the belt pulley is stuck, heat it with a hot air gun. Try not to use a puller as it can deform the belt pulley. Do not lose the key that sits between the pulley and the shaft.

5



- Place the bearing housing in a vice and remove the blade and washers.

6



- Replace the blade bolt in the shaft. Screw it in a few turns and tap or press down the hub. Do not lose the key that sits between the hub and the shaft.
- Mark one end of the shaft. Press or tap out the shaft.
- Tap out the bearing and remove the spacer.

Fit in the reverse order.

Make sure that the shaft is mounted in the same direction as when it was removed, otherwise the keys will not fit the grooves.

Blade bearings are tightened with a torque of 20-25 Nm (14-18) lbf. ft. The blade bearings are tightened with a torque of 75-80 Nm (52-56 lbf. ft).

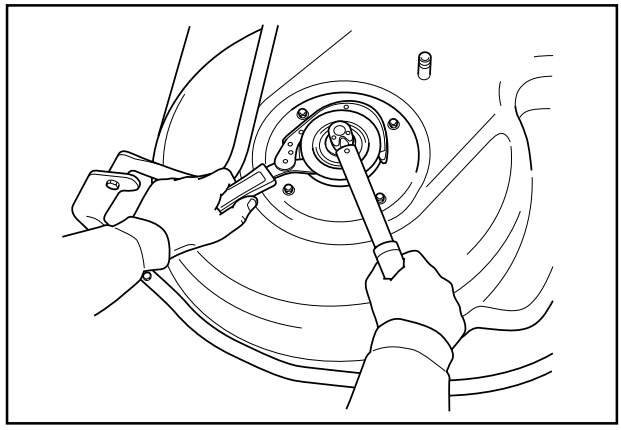
The belt pulley is tightened with a torque of 75-80 Nm (52-56 lbf. ft).

IMPORTANT INFORMATION

When tightening the blade shaft screws, the transmission side should always be tightened first and then the blade screws.

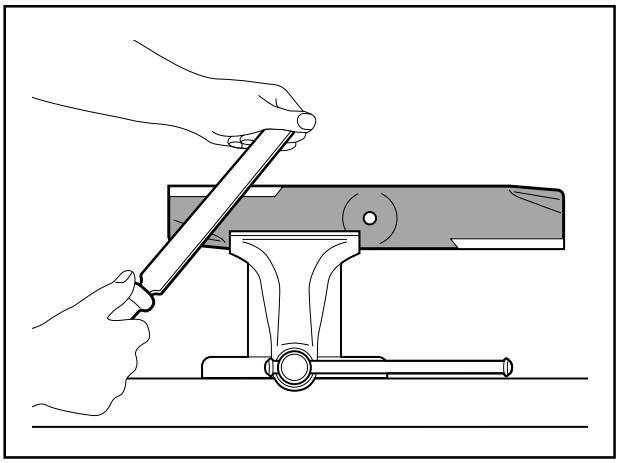
The belt pulley can be turned the wrong way, the thicker side should be turned downwards towards the blade.

An oil filter wrench, for example, can be used to hold the pulley in place when the screw is tightened.



Grinding and balancing of blades

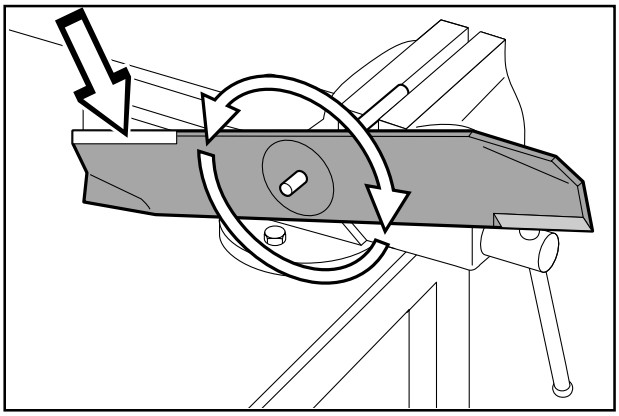
1



WARNING!
When working with the blades, use protective gloves.

- Remove the blades according to the decription in the previous section.
- Clamp the blade in a screw vice and file it so that it becomes sharp.

2



Balance the blade as follows:

- Fix, for example, a mandrel horizontally in a screw vice according to the diagram.
- Thread the hole in the centre of the blade over the punch and make sure that the blade is equally weighted. The diagram shows a blade which needs to be adjusted, it must be ground further to obtain the correct balance (at the arrow).
- Installation is carried out in the reverse removing order.

IMPORTANT INFORMATION

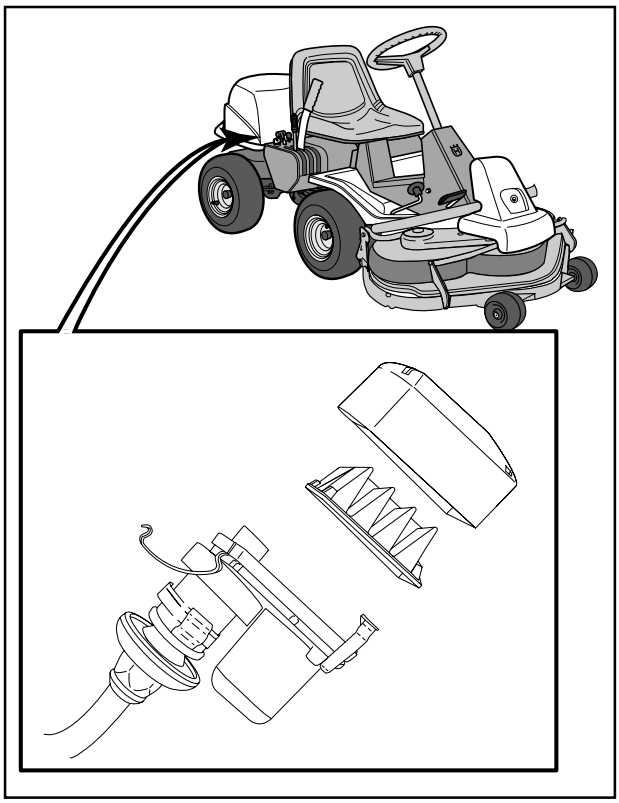
The friction washer on a BioClip or Combi 103 unit must be replaced when replacing the shear pin.

Pulse air valve intake filter

Rider Pro 15 and Pro 18

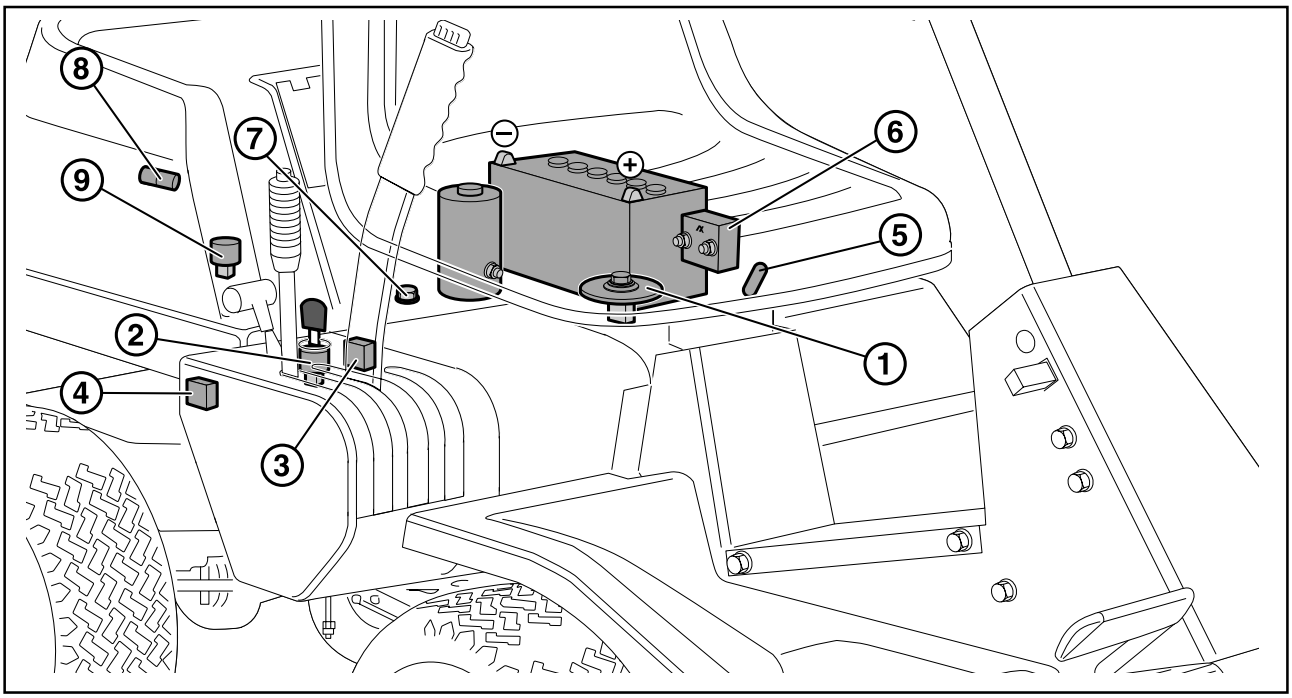
Cleaning the pulse air filter

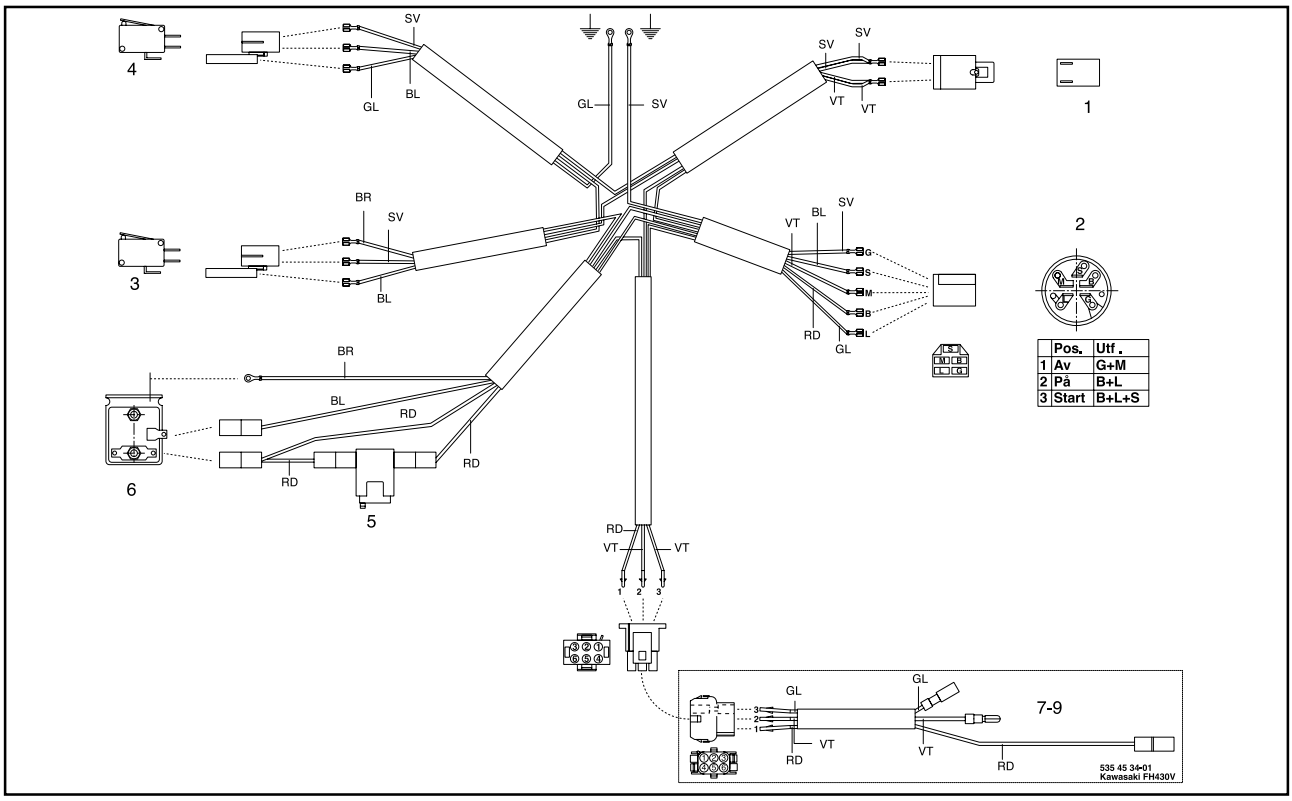
- Tip the chair and open the engine hood.
- Loosen the four quick-action clips and lift off the cover and remove the filter.
- Blow out the filter using compressed air. Replace the filter if it is damaged or cannot be blown clean.
- Replace the filter in the cover and secure the cover using the quick-action clips. Replace the engine hood.



Electrical system

Circuit diagram Rider 15V2



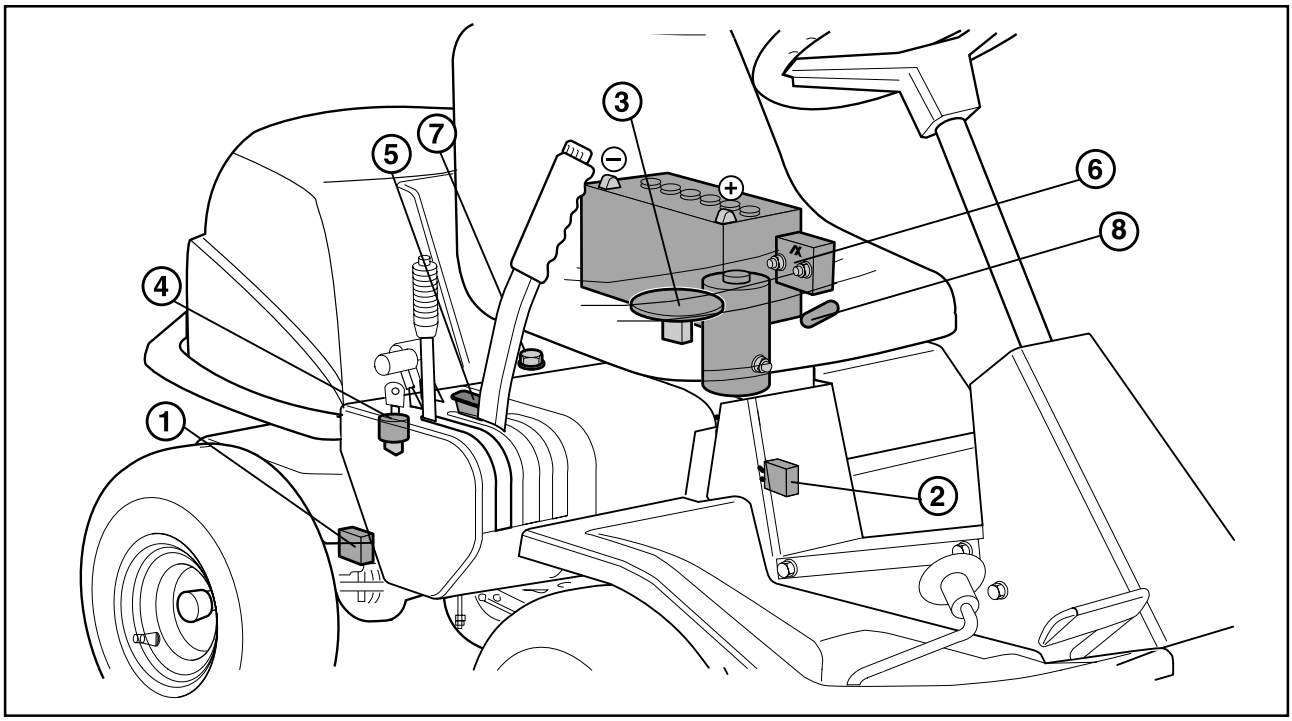


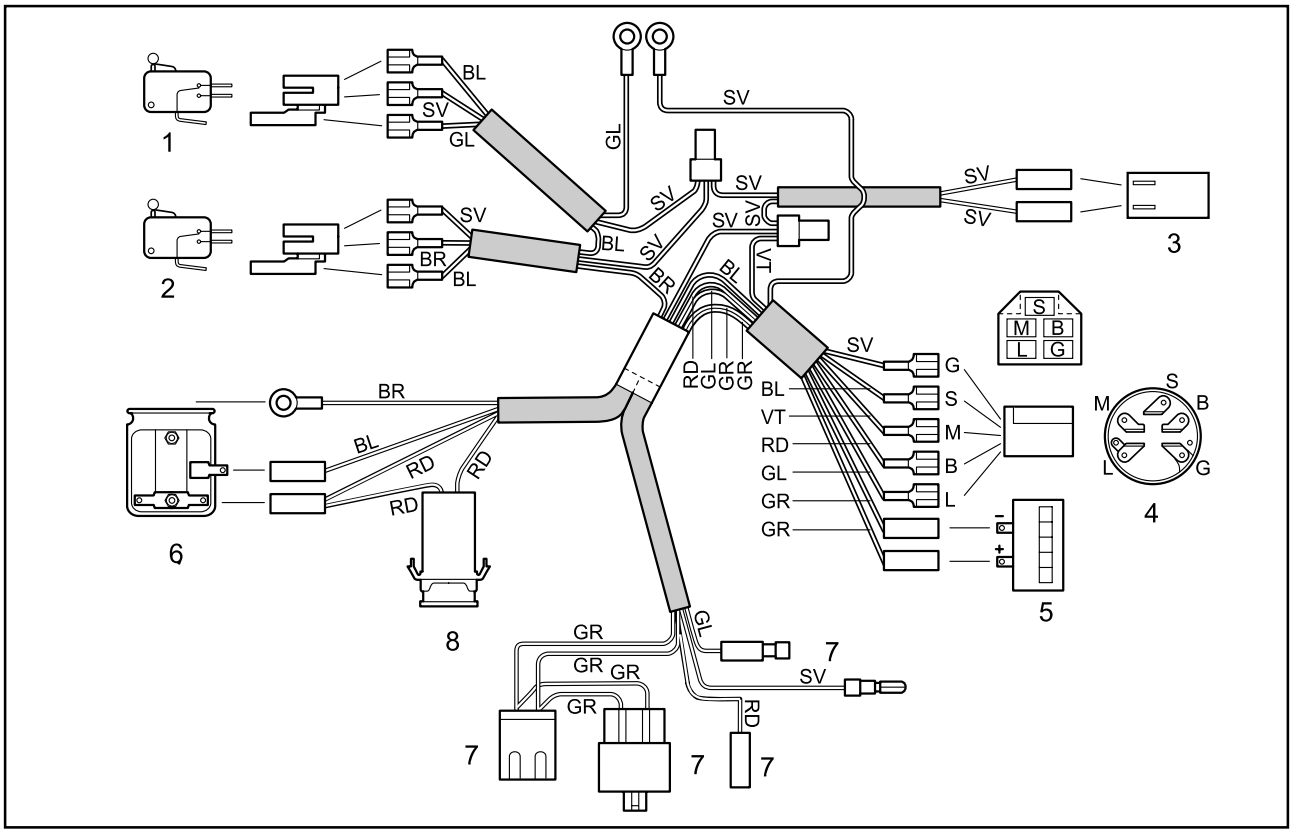
1. Microswitch, seat
2. Ignition lock
3. Microswitch, lifting lever
4. Microswitch, hydrostat
5. Fuse 15A
6. Start relay
7. Engine, charging
8. Engine, stop
9. Engine, solenoid valve fuel

Explanation of colour abbreviations in wiring diagram.

RD = Red
BL = Blue
VT = White
SV = Black
GL = Yellow
GR = Grey
BR = Brown

Circuit diagram Rider Pro 15



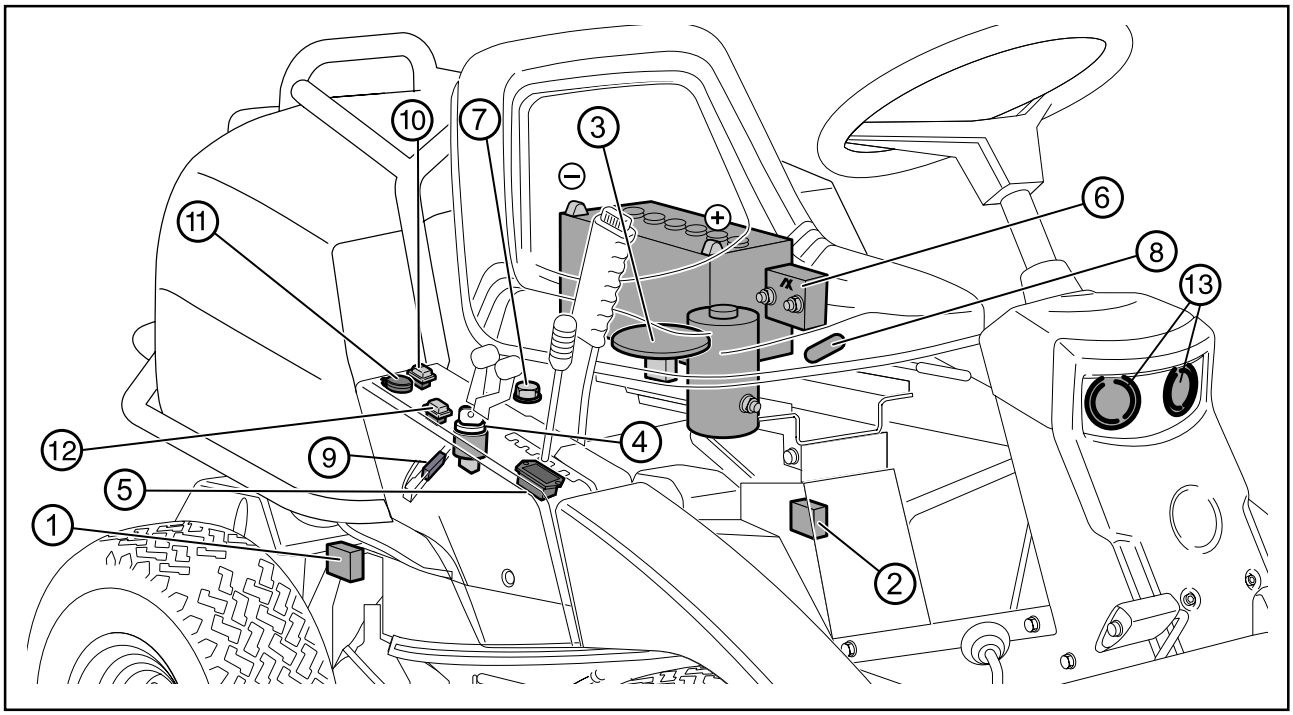


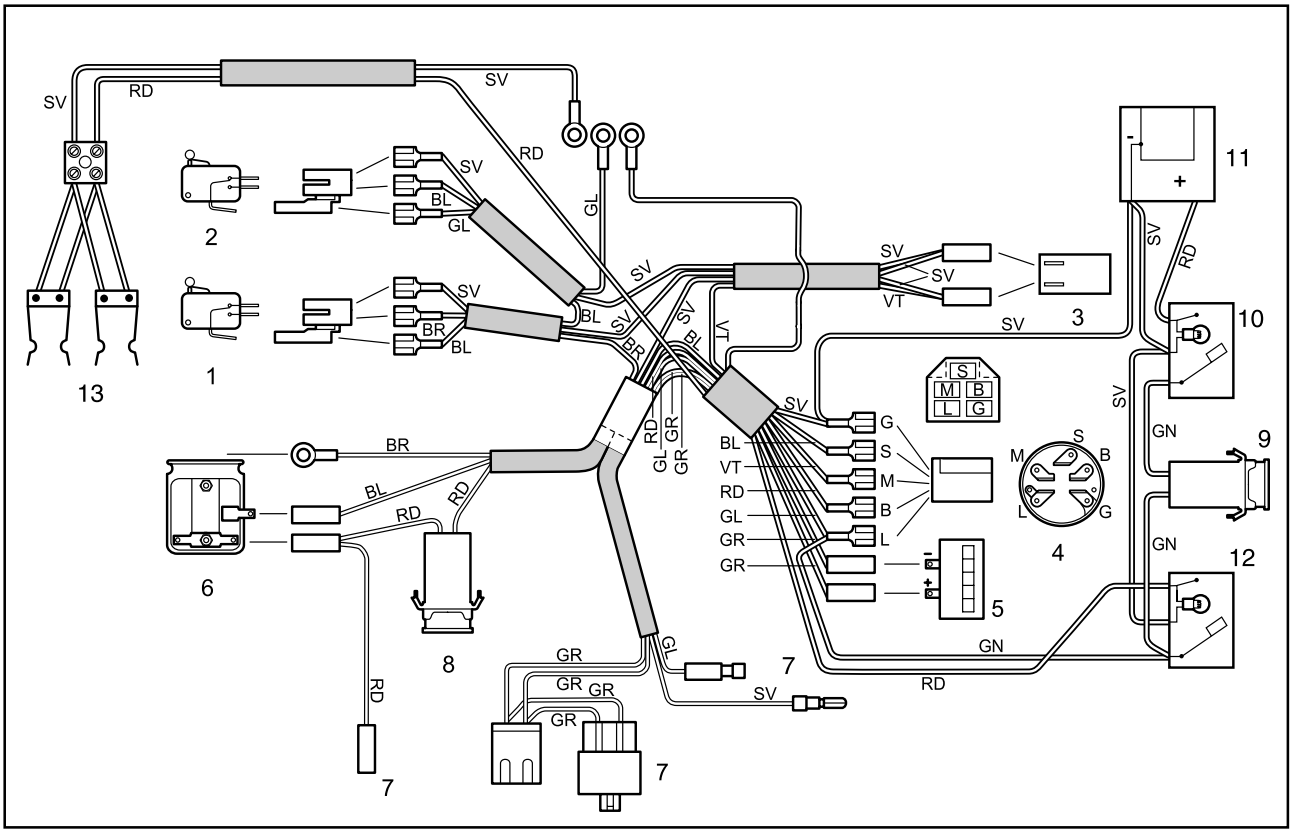
1. Microswitch, hydrostat
2. Microswitch, cutting unit
3. Microswitch, seat
4. Ignition lock
5. Counter
6. Start relay
7. Engine
8. Fuse 15A

Explanation of colour abbreviations in wiring diagram.

RD = Red
BL = Blue
VT = White
SV = Black
GL = Yellow
GR = Grey
BR = Brown

Circuit diagram Rider Pro 18





1. Microswitch, hydrostat
2. Microswitch, cutting unit
3. Microswitch, seat
4. Ignition lock
5. Counter
6. Start relay
7. Engine
8. Fuse 15A
9. Fuse power outlet
10. Mains switch power outlet
11. Power outlet
12. Power outlet lighting
13. Headlight

Explanation of colour abbreviations in wiring diagram.

RD = Red
BL = Blue
VT = White
SV = Black
GL = Yellow
GR = Grey
BR = Brown

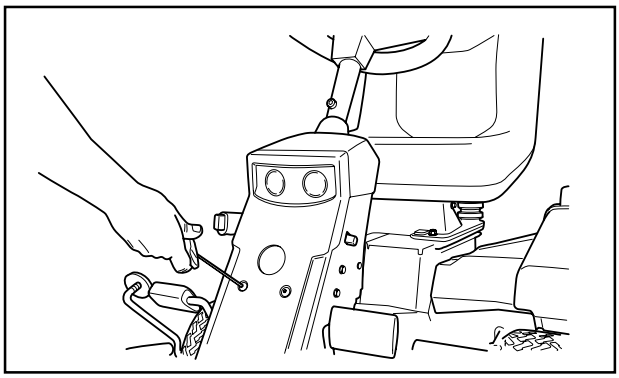
Replacing the light bulbs

Rider Pro 18

For information about the bulb type, see ‘Technical Data’.

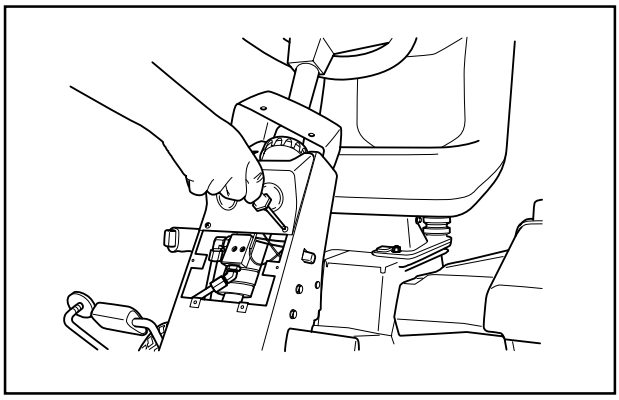
1. Unscrew the two screws holding the cover on the power steering housing.

   Lift up the cover and turn it around the steering shaft.

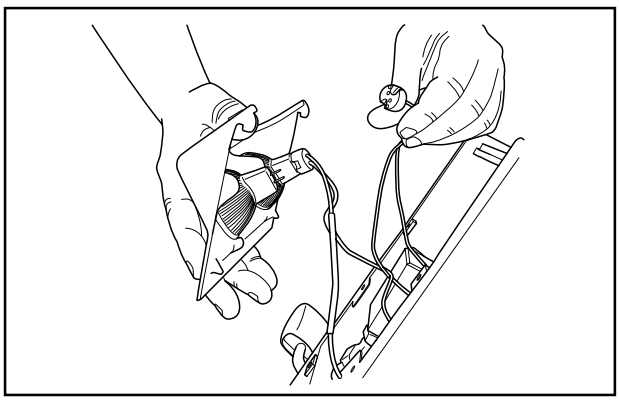


2. Unscrew the two screws holding the lamp insert.

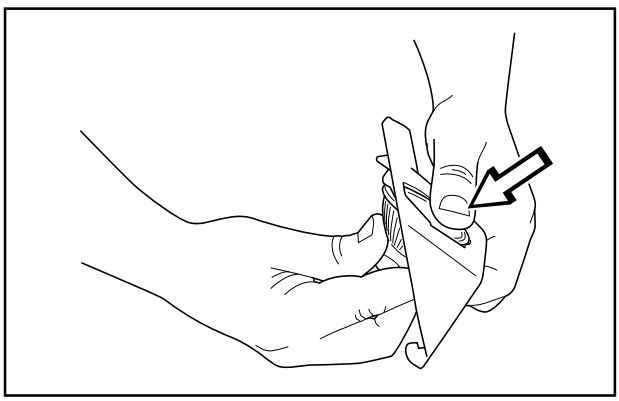
   Lift out the lamp insert.



3. Disconnect the cables from the bulbs
4. Lift out the bulbs from the insert.



5. Insert the new bulbs. Make sure you use your thumb to support the front.



6. Refit the cables, lamp insert and the cover on the power steering housing.

Inspecting the safety system

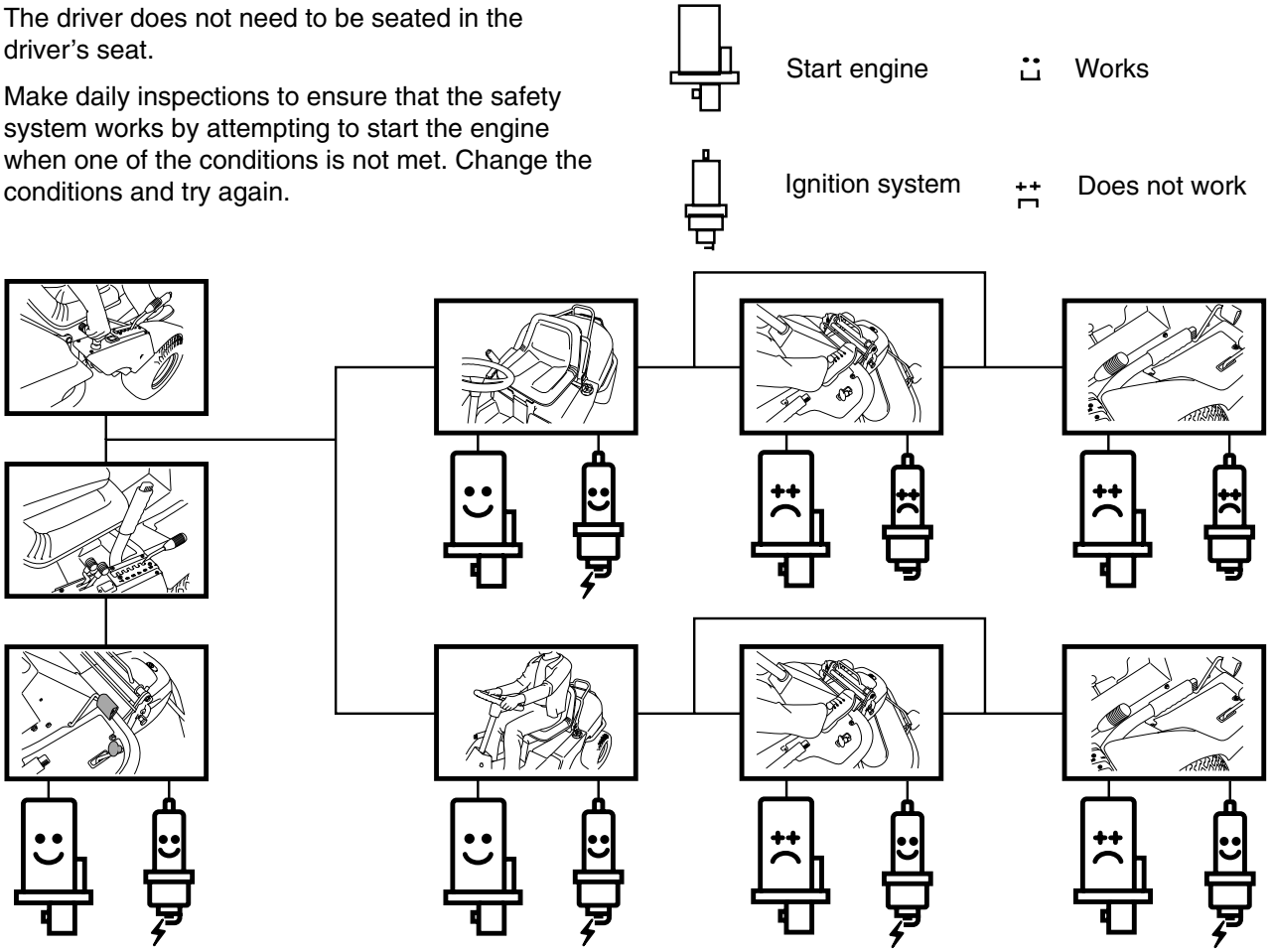
The Rider is equipped with a safety system that prevents starting or driving under the following conditions:

The engine should only be possible to start when the cutting unit is in its raised position and the hydrostat pedals are in the neutral position.

The driver does not need to be seated in the driver's seat.

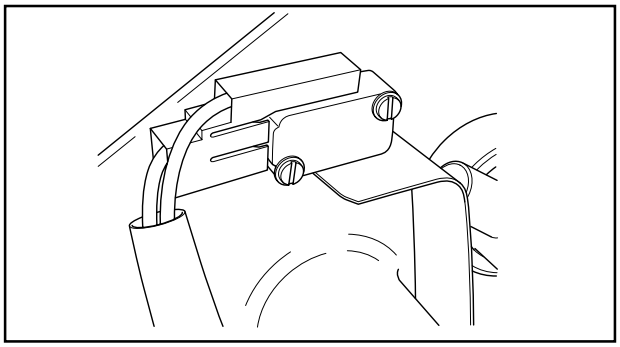
Make daily inspections to ensure that the safety system works by attempting to start the engine when one of the conditions is not met. Change the conditions and try again.

Check that the engine stops if you temporarily move out off the driver's seat while the cutting unit is lowered or the hydrostat pedals are not in the neutral position.



Microswitch cutting unit

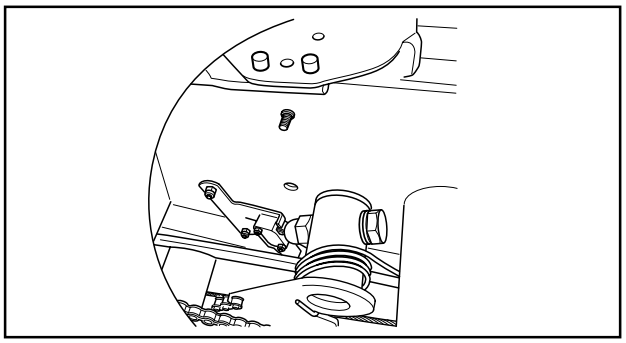
Rider 15V2 and Pro 15



1. Loosen the right-hand wing cover.
2. Remove the inner protecting plate on the gear lever carrier.
3. Disconnect the connector from the microswitch.
4. Remove the microswitch.

Assembling is done in the reverse order without setting.

Rider Pro 18

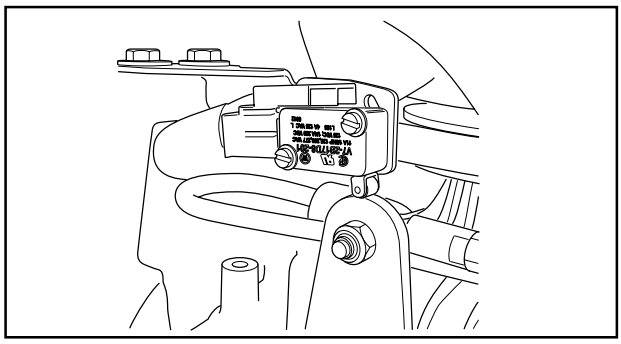


The microswitch is placed in the frame tunnel. When replacing the microswitch, a new setting is required:

Check that the dome nut for the chain segment is in position for maximum effect of the microswitch.

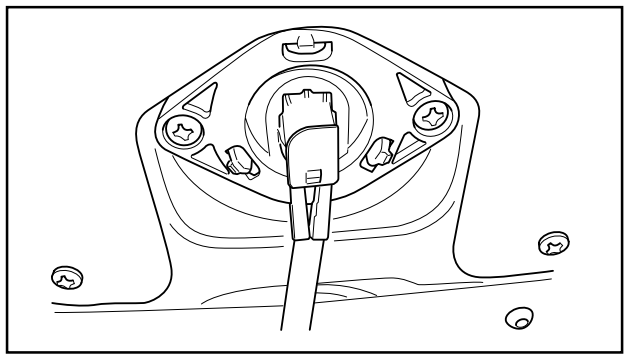
Adjust the microswitch so that it is definitely activated by the dome nut, but allows extra motion (must not bottom out).

Microswitch: Neutral Position



1. Remove the transmission cover.
2. Check the hydrostatic cable adjustment.
3. Adjust the microswitch so that it is activated by the highest point in the hydrostatic arm's path when no driving pedal is pressed.
4. Adjust the microswitch so that it is definitely activated by the hydrostatic arm, but allows extra motion (it must not bottom out). Tip: Hold a feeler gauge between the switch and the arm when making the adjustment.
5. Replace the transmission cover.

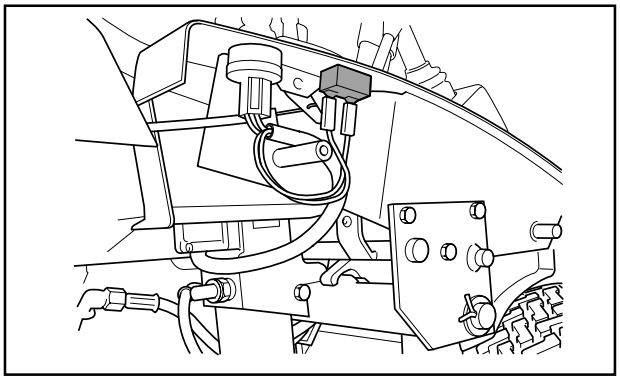
Microswitch seat



In certain cases it may be necessary to remove the seat from the chassis.

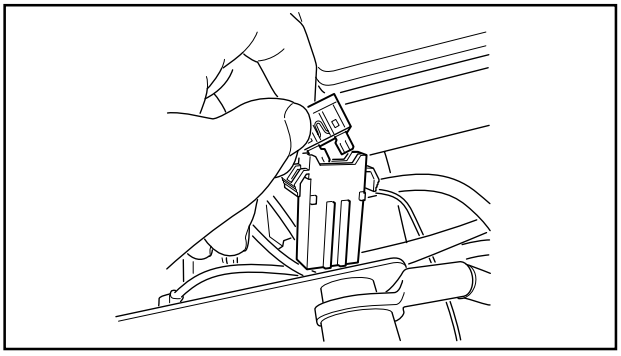
The microswitch is located on the underside of the seat and can be replaced together with the holder without adjustment. The switch inside the holder cannot be replaced alone as it is glued into place.

Hour meter



1. Remove the right-hand side cover from the lever housing.
2. Release the cables from the hour meter.
3. Drill out the rivets attaching the hour meter from above.
4. Assemble the parts in the reverse order. The hour meter may be attached with screws, nuts and spring washers if suitable rivets are unavailable.

Main fuse



The fuse is placed in a detachable holder under the battery case's cover, in front of the battery.

Type: Flat pin, 15 A.

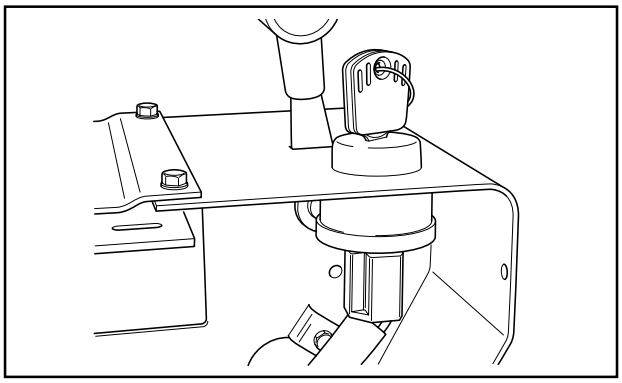
Do not use any other type of fuse when replacing.

A blown fuse is indicated by a burnt connector.

Pull the fuse from the holder when replacing.

The fuse is there to protect the electrical system. If it blows again shortly after replacement, it is due to a short circuit, which must be fixed before the machine can be put into operation again.

Ignition and Starter Lock



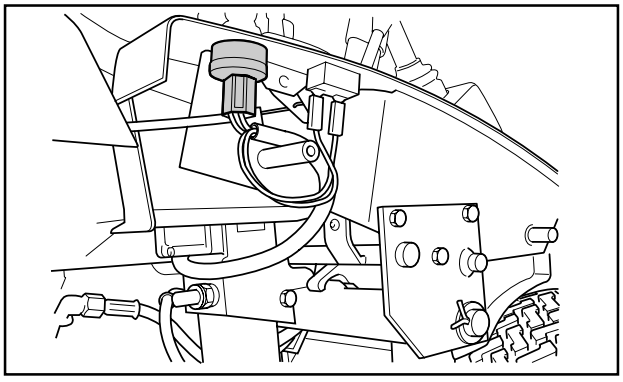
Rider 15V2 and Pro 15

1. Loosen the right-hand wing cover.
2. Remove the inner protecting plate on the gear lever carrier.
3. Release the contact box from the ignition switch by pulling it straight down.
4. Remove the ignition key and the rubber seal.
5. Remove the nut and the ignition switch.

Rider Pro 18

1. Remove the right-hand side cover from the lever housing.
2. Release the contact box from the ignition switch by pulling it straight down.
3. Remove the ignition key and the rubber seal.
4. Remove the nut and the ignition switch.

   Assemble the parts in the reverse order. Make sure the connector ends up in the proper position (click-lock).



Hydraulic System

General

Hydraulic Hygiene

Keep the hydraulic system clean. Remember to:

- Thoroughly clean before the filler cap is opened or any connector loosened.
- Use clean containers when topping up the oil.
- Only use pure oil that has been stored in a sealed container.
- Do not reuse drained oil.
- Change the oil and filter according to the intervals specified in the Service Schedule.

In order for a hydraulic system to function without problem, it must be free from foreign objects. When used, the system produces particles, which can cause both wear and abnormal function. In order to remove these particles, the system contains filters. The filters are sized so as to capture the produced particles, but if contaminants are introduced from outside the system, the filters can quickly become clogged and fail to function as intended. If there are contaminants in the system, further contamination will be produced in a self-propagating cycle. The result will be function disruptions and much work to clean the system.

The particles that do the most damage are of the same size as the play between the moving parts in the components. Normal play in pumps and valves is from 3-5 µm and up (1 µm = a thousandth of a mm). In this context, we can mention that a particle measuring 40 mm can be seen with the naked eye.

The particles, which are generated during operation or enter the system during repairs and service, are usually comprised of:

- Wear and tear products from components, mainly those with moving parts, such as pumps and motors.
- Dust, which enters through the hydraulic tank's vent.
- Water, which is formed through condensation. (Steam enters with the ventilation air.)
- Dirt particles, which enter the system with, for example, moving piston rods.
- Sludge etc. from the oil decomposing.
- Corrosion products from the system, which are due to the oil not being changed in time and containing water and other aggressive substances.
- Dirt particles that enter the system include:

- Contaminants entering when topping up with oil.
- Dust particles from the workshop.
- Gasket and thread sealants from assembly.
- Dirt from storage and handling before assembly.
- Fibres from rags, filters, etc.
- Dirt from maintenance areas due to insufficient cleaning before disassembly.
- Dirt and dust entering the system via unclean protective plugs.

Water, even in small amounts, can cause rust build-up on sanded surfaces, especially if the system is not used, and contributes to the production of sludge products. These clog the filters, leading to circulation problems and the hydraulic pumps can begin to draw air (cavitation).

Small fibres and threads from drying cloths or clothing can build up in jets and throttles. The actual fibres do not cause much damage, but the build-up can clog the system and cause wear on system components.

Each dirt particle is an abrasive, which causes more contamination, which in turn leads to permanent damage. Each time the hydraulic system is opened, the number of particles increases. After a few hours operation, most of the particles are captured by the filters. Avoid, therefore, opening the hydraulic system unless necessary, as every action entails a risk of more contaminants entering the system, even if the work is carried out professionally.

Hydraulic Oils

The oil is as important as every other part of the hydraulic system. It has been noted that about 70% of all hydraulic problems are caused by the use of unsuitable oil types, which contain dirt or other contaminants, to fill the system. The greater part of the contaminants in the oil comprise, in general, dirt that has entered the system from the outside.

Fixing Oil Leaks

Cavitation due to penetrating air can cause internal damage to pumps and motors. Air can enter the system when there is an oil leak. It is therefore important to rectify oil leaks as soon as possible.

Keep the hydraulic oil clean

Dirt and contaminants are the greatest enemies of a hydraulic system. Moreover, long work sessions at high power are very dependent on whether the hydraulic oil has been able to retain its condition. Only use the type of oil specified in the lubrication schedule. Ensure that it is checked at regular intervals and kept at the right level.
All good oils are supplied in clean containers and are filtered so that they are as free from contaminants as possible. It is when the container is opened or stored that problems occur. When a container is opened, one must be sure that the area around the cap is completely free from dust, dirt, rag fibres, and water. If a special container, funnel, or hose is required for filling the system, ensure that it is clean.

Working Methods

Cleanliness also applies to components that have been removed or shall be fitted. Keep in mind that a replaced component should probably be inspected with the aid of test equipment at a workshop. It is important that the component is in the same shape when it is inspected as it was when it was removed from the machine. Otherwise, the real reason for the malfunction cannot be established and the test equipment can be made dirty. It can also be so that the submitted component is not faulty and is therefore returned without action. The following points should be gone through routinely when working with the hydraulic system:

1. Clean as necessary.
2. Protect the area where the work is to be done against dust and other impurities in the air. Plastic sheets and the like may be used.
3. Clean thoroughly with white spirit or equivalent. Remember that it is not enough to clean only those parts that are directly attacked. Areas from where dirt can fall onto the work area must also be cleaned, as must the tools used. Clean with a suitable brush, dry with a cloth, and clean again if needed. Finally, rinse the dismantling area, tubing equipment, and so on with pure white spirit.
4. Apply appropriate protection immediately after all pipes and hoses have been removed. Components (even those replaced) as well as pipes and tubing must be protected.

5 All components included in pipe fixtures shall be replaced or cleaned in pure white spirit and blown clean with compressed air before being refitted.

6. Maintain cleanliness when measuring pressure. Rinse both parts of the quick connectors with white spirit before each connection. Ensure that any protective components are clean before refitting.

System

Pressure to the hydraulic system is provided by the hydrostatic pump. A pressure limiting valve limits the maximum system pressure to about 45 bar/630 PSI. A hydraulic oil filter of the spin-on type is used to filter impurities. There is also a filter in the hydrostatic transmission. Both filters work together to keep the system as clean as possible.

Bleeding the Hydraulic System

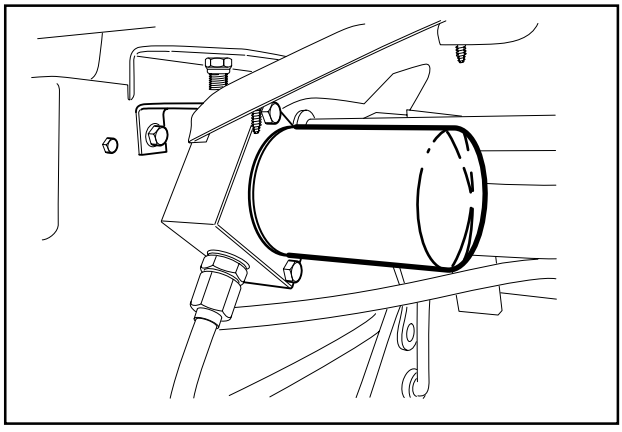
See ‘Repair Instructions\Bleeding of Hydrostatic and Hydraulic Systems’.

Power Steering

The power steering is described under ‘Design and Function\Steering’. See also ‘Repair Instructions\Removing the Power Steering’.

Hydraulic oil filter, replacement

1. Dismantle the oil filter. If necessary, use a filter remover.
2. Wipe new, clean engine oil onto the seal for the new filter.
3. Mount the filter by hand with + 3/4 turn.
4. Remove the transmission cover and fill the transmission oil tank. The oil level may exceed the maximum mark, see point 6. Pay attention when running the engine and top up so that the tank does not run dry.
5. Run the engine, turn the steering, and then check that there are no leaks around the oil filter seal.
6. Check the oil level in the transmission, top up if necessary. The oil filter holds 0.3 litres/0.3 US qt of oil.
7. Replace the transmission cover.



Pressure Limiting Valve

If the hydraulic pressure is too low, it can be due to dirt trapped in the pressure limiting valve.

IMPORTANT INFORMATION

Incorrect hydraulic pressure is almost never due to an incorrectly adjusted pressure limiting valve.

Check the hydraulic system thoroughly for faults before changing the valve setting.

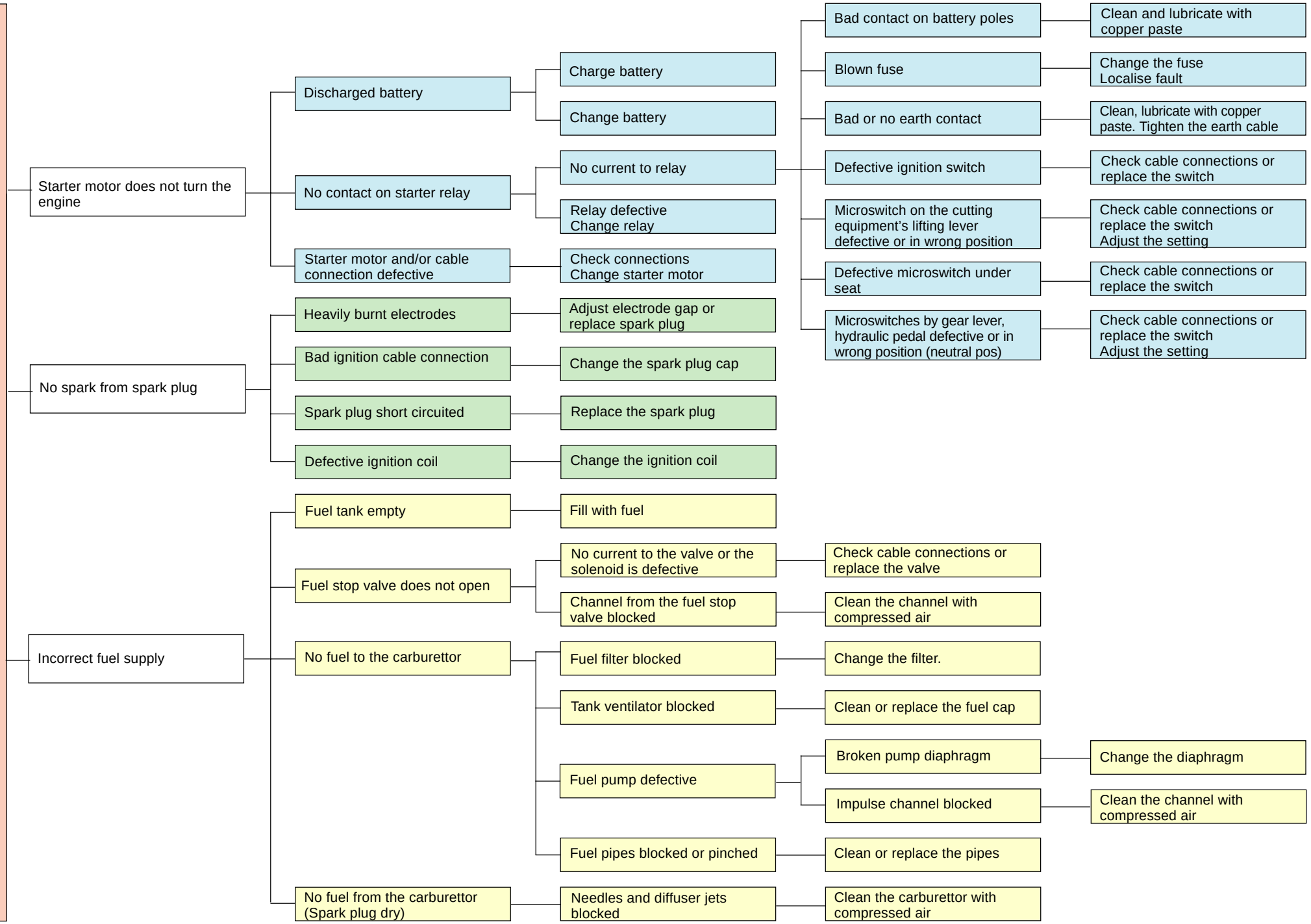
An excess flow valve that is set too high will damage the power steering.

IMPORTANT INFORMATION

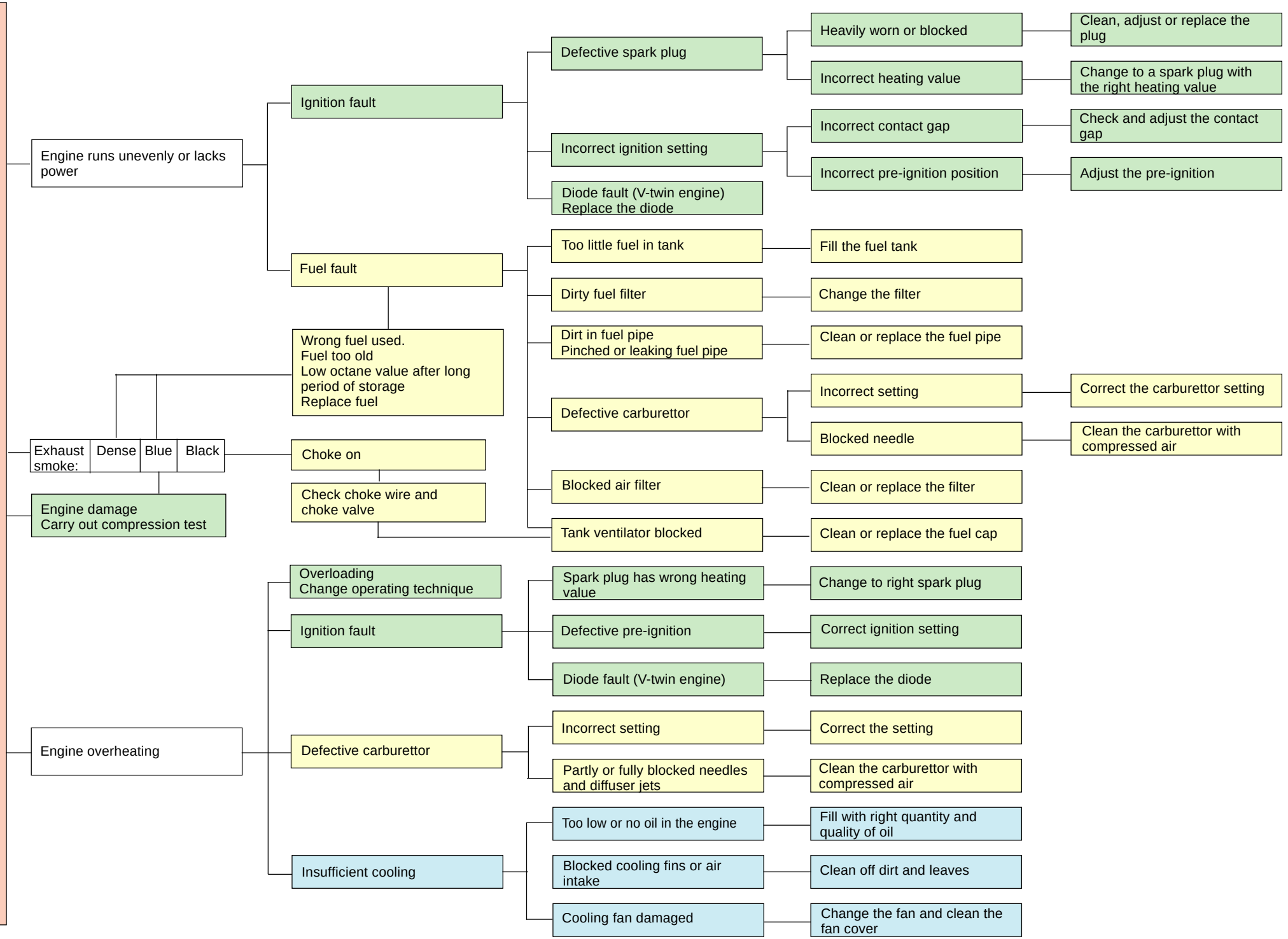
Waste hydraulic oil and used oil filters should be treated as environmentally hazardous and submitted to a designated area for disposal.

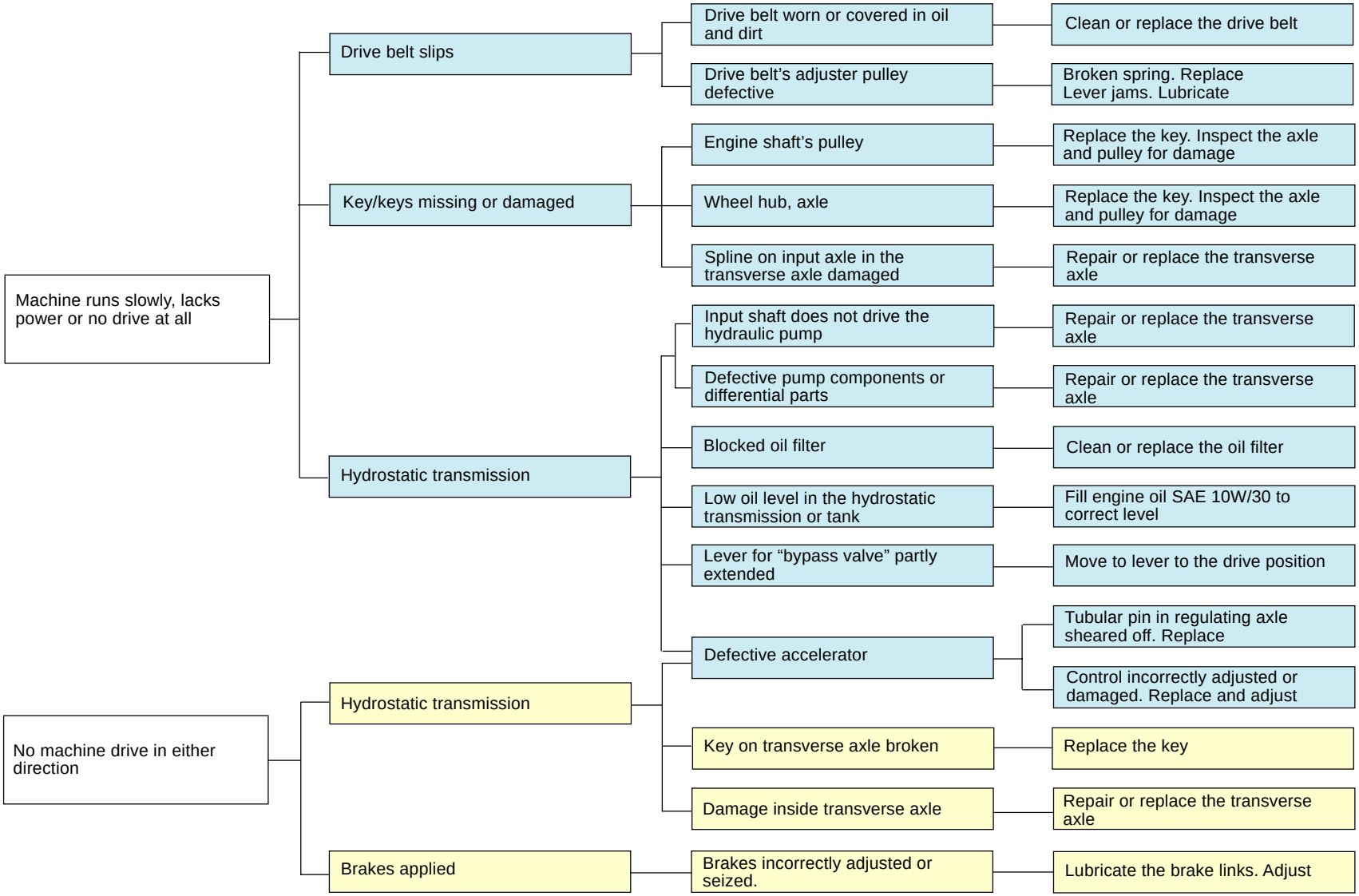
Avoid skin contact; wash with soap and water in case of spills.

ENGINE WILL NOT START

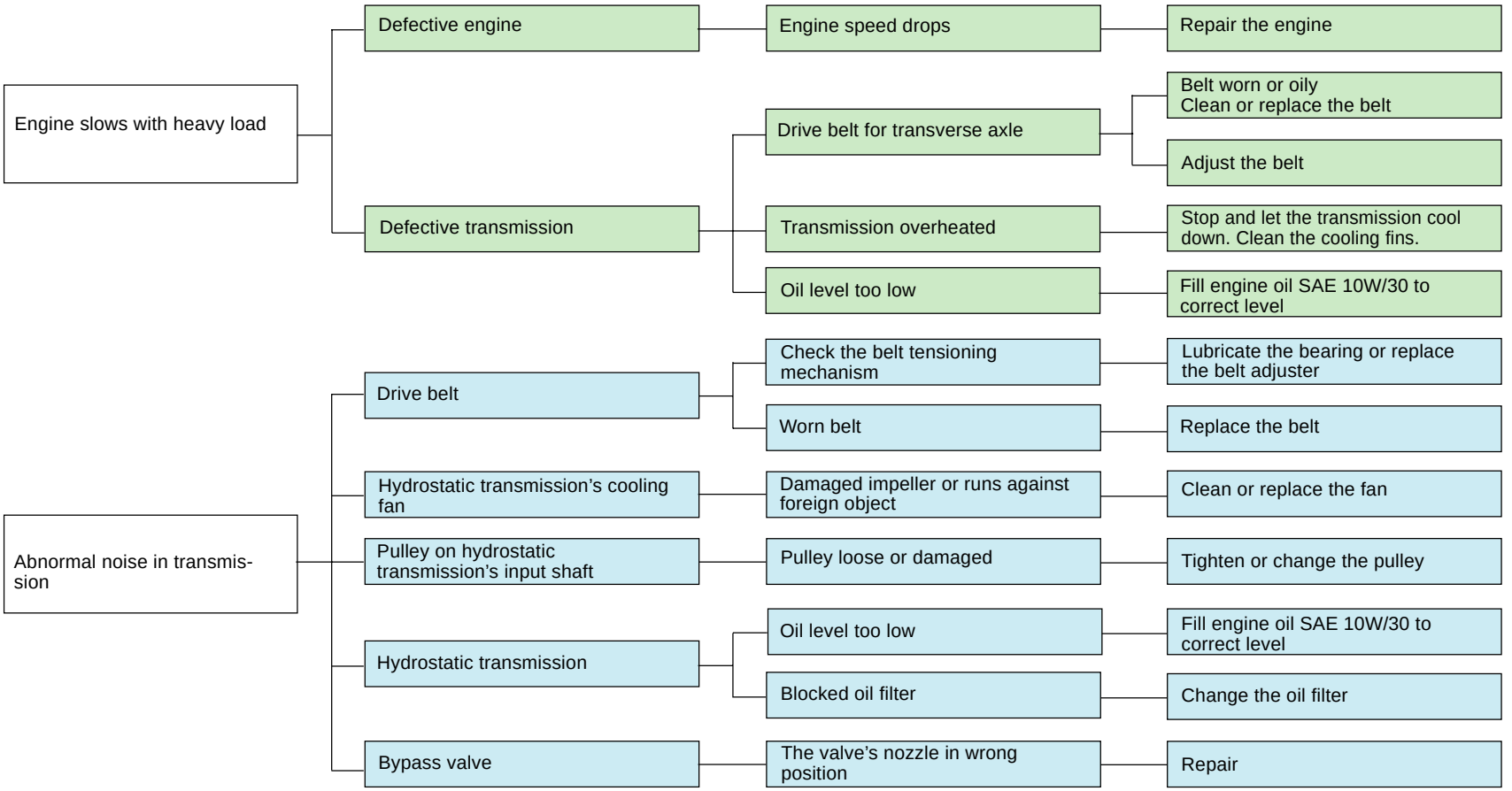


ENGINE STARTS BUT DOES NOT RUN SATISFACTORILY





The hydrostatic transmission must not be opened during the warranty period.



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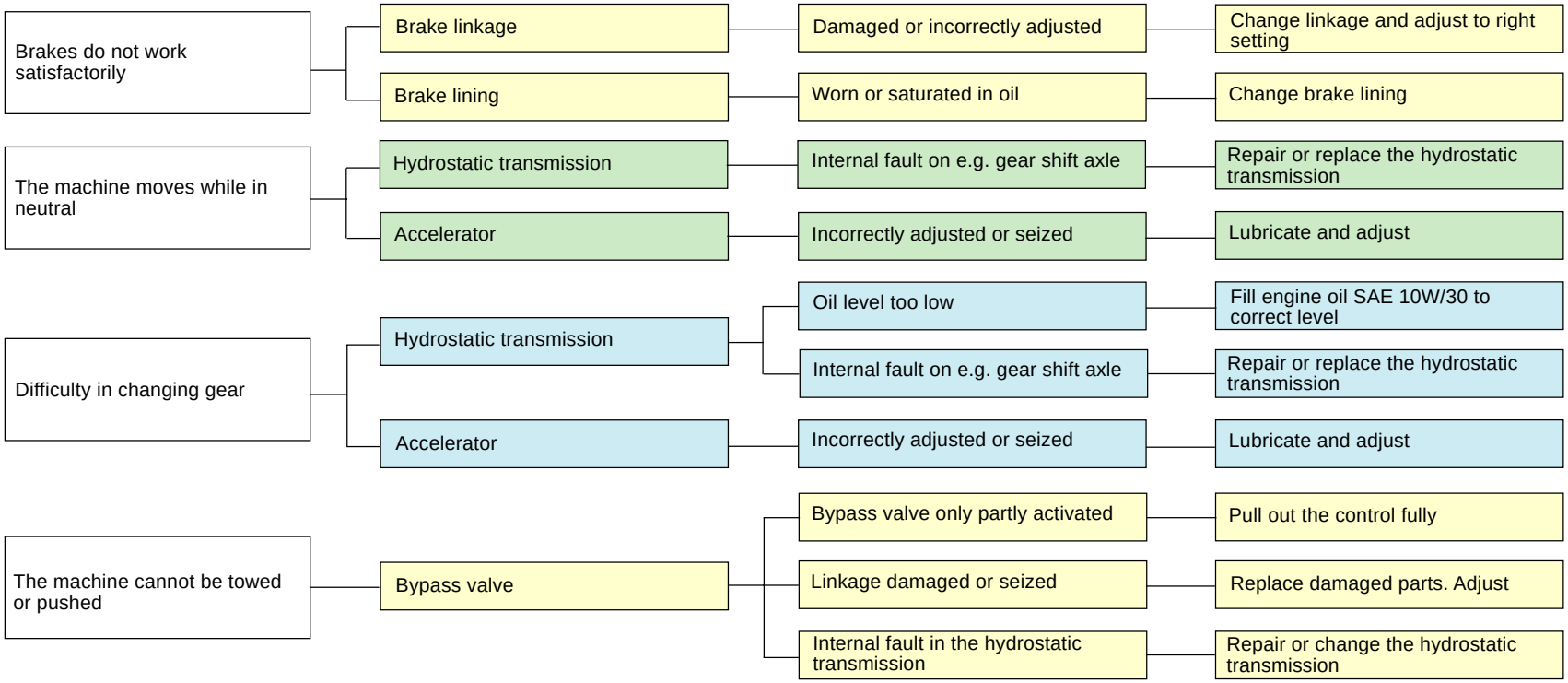

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